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ATS with Power Distribution

InfraStruXure Power Generation System

Operation Manual

About This Manual

Audience

This manual is intended for end-users of the InfraStruXure Automatic Transfer Switch with Power Distribution (ATS). It provides important safety warnings and instructions, an overview of the ATS components, a detailed discussion of the ATS display interface, instructions on how to add components to the ATS, product and warranty information, and technical specifications.

Companion manuals

For additional information about the ATS and the InfraStruXure Power Generation System, see the following InfraStruXure Power Generation System manuals:

- ATS with Power Distribution Unpacking Sheet (990-1842)
- Electrical Installation Manual (990-1844A)
- APC InfraStruXure Generator Reference Manual (990-1846A)
- On-line Network Management User's Guide (990-1993)

How to find updates to this manual

You can check for updates to this manual by clicking on the **User Manuals** link on the **Support** page of the APC Web site (**www.apc.com**). In the list of **Power Generation System** manuals, look for the latest letter revision (A, B, etc.) of the part number on the back cover of this manual.

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Safety

Overview

Save these instructions

This manual contains important instructions that must be followed during installation, operation, and maintenance of the ATS with Power Distribution.

Safety symbols used in this manual

Indicates an electrical hazard, which, if not avoided, could result in injury or death.

Indicates a hazard, which, if not avoided, could result in severe personal injury or substantial damage to product or other property.

Indicates a potential hazard, which, if not avoided, could result in personal injury or damage to product or other property.

Indicates a heavy load that should not be lifted without assistance.

Indicates important information.

Cross-reference symbols used in this manual

Indicates that more information is available on the same subject in a different section of this manual.

Indicates that more information is available on the same subject in a different manual.

Warnings

The components in the InfraStruXure Power Generation System and UPS power distribution system can pose life-threatening danger when improperly installed, operated, or maintained. To prevent accidents, be aware of the dangers and act safely. Read and follow all of the safety instructions and warnings in this manual and in all of your component manuals.

The InfraStruXure Power Generation System is an Optional Standby System

The generator and Automatic Transfer Switch (ATS) that you purchased from APC is classified as an *Optional Standby System*—it provides backup or standby power to data centers in the event of a sustained power failure.

The InfraStruXure Power Generation System is not to be classified as an *Emergency System* that is essential for safety to human life (e.g., fire pumps, operating room, and life-support equipment in hospitals) as legally required by a municipal state, federal, or other governmental codes.

The InfraStruXure Power Generation System is not to be classified as a *Legally-Required Standby System* as it is not supplying power to aid in fire fighting, rescue operations, control of health hazards (e.g., sewage) and similar operations as required by a municipal, state, federal, or other governmental codes.

Emergency and *Legally-Required Systems* are not allowed to rely on municipal fuel for operation and municipal water for cooling. *Emergency* and *Legally-Required Systems* require dual fuel systems, with one of them being a two-hour, on-site fuel supply.

Your InfraStruXure Power Generation System is not to be classified as an *Integrated Electrical System* as an orderly shutdown is not required to prevent damage to the generator. The generator is not to be paralleled with another generator.

Your generator will operate at its rated load without being re-fueled for a minimum of six hours, and should run for a minimum of 12 hours.

Your generator can be without electrical power to the load terminals of the transfer switch for 60 seconds maximum, but will typically be without power for no more than 10 seconds.

Wire sizing

This product and this manual were designed for the 250-amp ATS. All wiring recommendations were sized for this amperage in accordance with the United States National Electric Code (NEC). This does not prevent you from using the ATS at a lower current with smaller wire sizes. If you decide to operate this ATS at a lower current, ensure that the wire sizes are in accordance with the NEC and local codes.

Installation

See also

For complete installation instructions, see the *InfraStruXure Power Generation System Electrical Installation* manual.

Install this ATS in accordance to the National Electrical Code (NFPA 75) in the United States, and install in accordance to the Canadian Electrical Code (CSA C22.1-02) in Canada.

When connecting Source 1 to the ATS, install a circuit breaker to protect the ATS from over-current. This circuit breaker must be rated at 250 A. For 208 V installations, the circuit breaker must have a 35,000 rms symmetrical ampere rating. For 480 V installations, the circuit breaker must have a 65,000 rms symmetrical ampere rating.

Inspection and testing

This ATS shall be inspected weekly and tested monthly by a competent service person, in accordance with NFPA 110.

Total power off procedure

To reduce risk of electric shock or injury to persons, disconnect all sources of supply before servicing. To disconnect all sources of supply, follow this procedure:

1. Set the Automatic Operation switch on the dead front of the ATS to **Disable**.
2. Set the Source 1 switch on the ATS to OFF.
3. Set the Source 2 switch on the ATS to OFF.
4. Set the main Source 1 circuit breaker to OFF.
5. Set the main Source 2 circuit breaker to OFF.
6. If Source 2 is a generator, set the generator control switch to OFF, or set the generator control switch to **Manual**, if OFF is not an option.

Operating environment

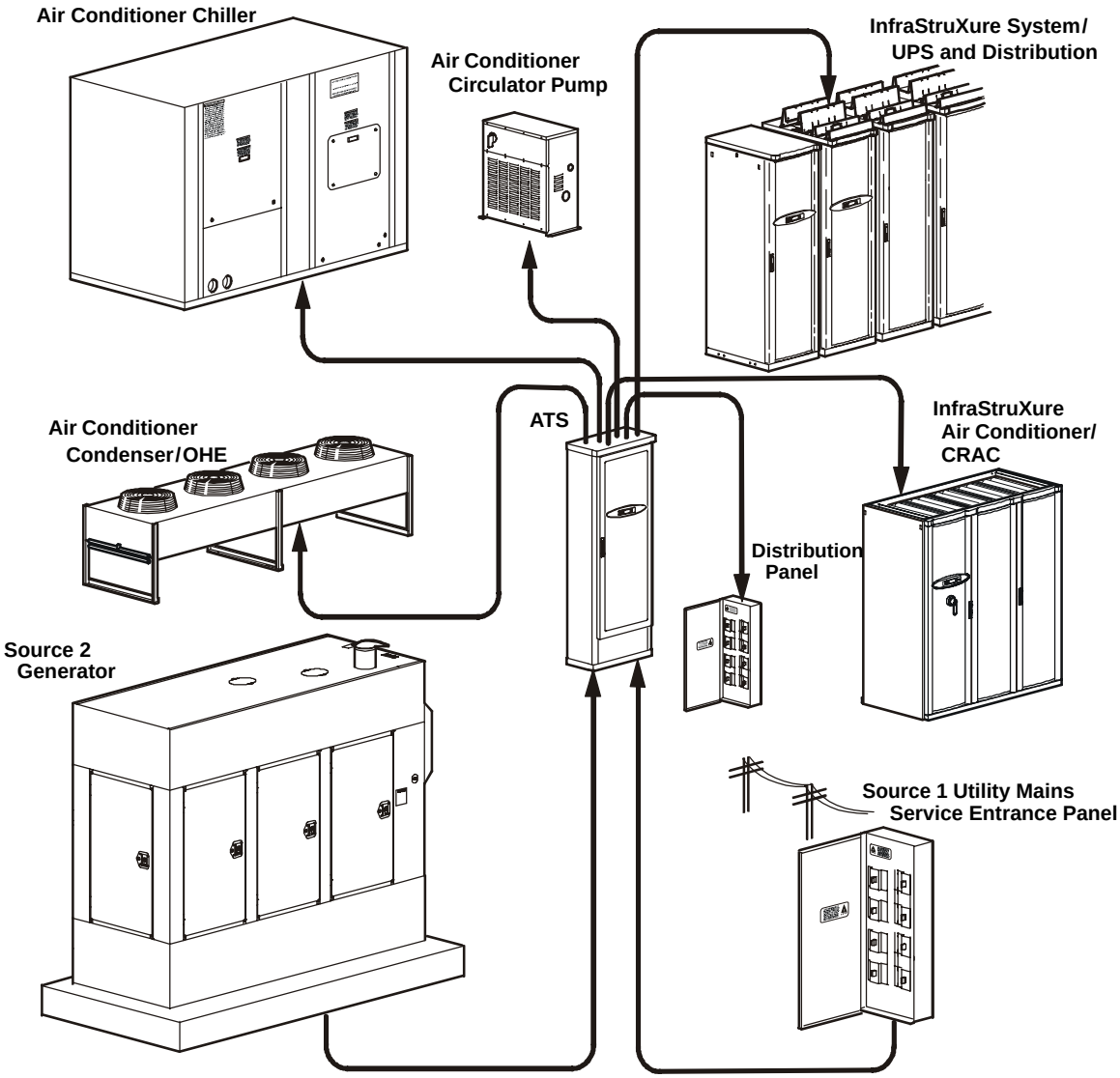
Indoor use only, protected from water and conductive contaminates.

Temperature	23 to 104°F (–5 to 40°C)
Humidity	0–95%, non-condensing
Elevation	6,562 ft (2000 m)

Overview

InfraStruXure Power Generation System

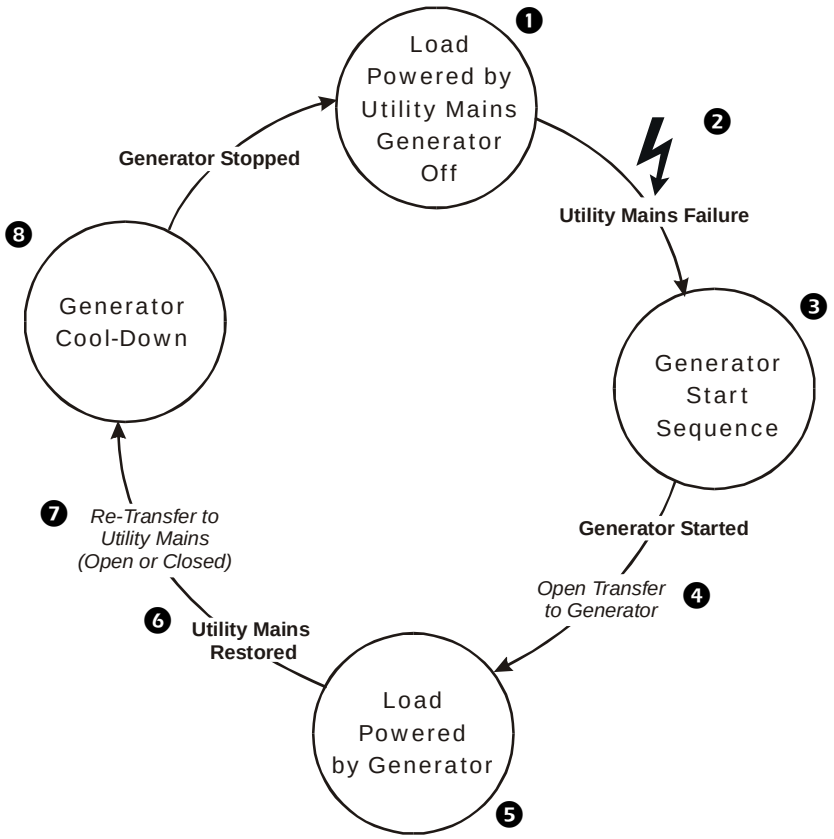
The InfraStruXure Power Generation System consists of a diesel-powered generator and an Automatic Transfer Switch with Power Distribution. The ATS is connected to utility mains (Source 1) and the generator (Source 2), with utility mains as the preferred source. The ATS is designed for the data center floor, which places the ATS and the power distribution closer to your data center equipment. Labels on the ATS provide quick visual indication of which ATS sub-feed breaker is supplying power to each piece of equipment. The diagram below provides examples of data center equipment that can be connected to the ATS.



How the InfraStruXure Power Generation System Operates

Operation of the ATS during a utility mains failure when automatic operation is enabled

Typically, your data center equipment is powered by utility mains [Source 1] (❶), and the generator is off. When the Source 1 line quality is bad (❷), the ATS signals the generator to start (❸).When the generator starts, the ATS will perform an open transfer to generator (❹).



The generator will run and support your data center equipment (❺) until utility mains comes back on-line (❻). Once the utility mains has been of good and stable quality for the length of the **Line Stable** setting and the generator has run for the **Min Gen Runtime** setting, your data center equipment is once again powered by utility mains (❼). The re-transfer to utility mains can be either an open or closed transfer. After the re-transfer, the generator will cool down (❽) and stop.

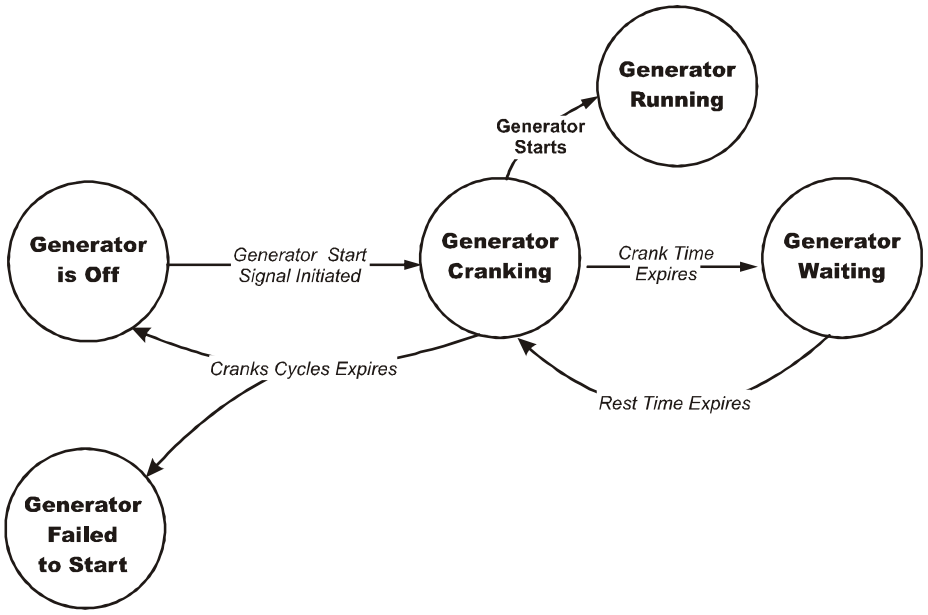
For more information.

See page page 33 for description of how the ATS determines that the **line quality is bad**.
See page 7 for a detailed description of the **start sequence**.
See page 8 for a detailed description of an **open and closed transfer**.
See page 7 for a detailed description of the **generator cool-down**.
See page page 35 for information about the **Line Stable** setting.
See page page 35 for information about the **Min Gen Runtime** setting.

Generator start sequence

The generator start sequence is followed only if the **Crank** setting in the **Operating Settings** menu on the **Generator Settings** screen on the ATS display interface menu is set to **Yes**. If it is enabled, the following sequence will occur:

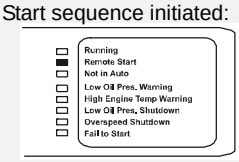
After a start signal is initiated, either by the ATS or manually, and the generator battery is good, the generator engine will crank and the generator should start. If the generator does not start, it will crank for the length of the **Crank Time**, and then rest for the length of the **Rest Time**. The generator will repeat this pattern for the number of times set in the **Crank Cycles** before stopping the attempt to start. Check the messages on the display interface for reasons why the generator did not start.



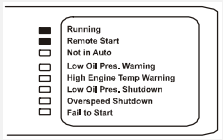
On the generator controller interface, the LEDs track conditions during the start sequence:

LED Behavior on the Generator Controller Interface

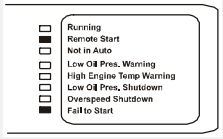
Start sequence initiated:



Generator Started:



Generator Failed to Start:



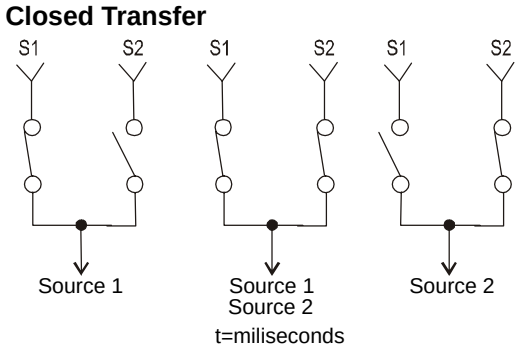
Generator cool-down

After the load is powered by the generator, and the utility mains returns and is powering the load, the generator may enter a cool-down period. If the coolant temperature is above the **Coolant Temperature Limit**, the generator will enter a cool-down period. During generator cool-down, the generator disconnects the alternator from the output and then runs at idle speed for 10 minutes. After the idle speed time expires, the generator will shut down. If the coolant temperature is not above the **Coolant Temperature Limit**, the generator will not enter a cool-down period but will shut down after the utility mains returns and is powering the load.

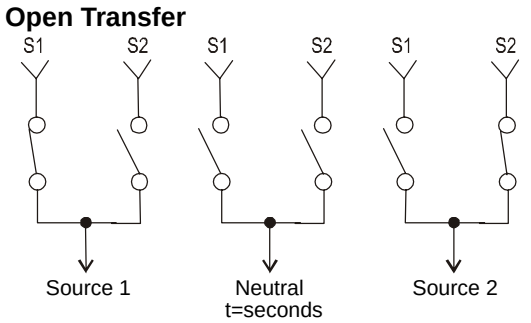
Open and closed transfers

When a transfer is not occurring, one switch is ON and the second switch is OFF.

During a closed transfer, the second switch will turn ON before the first switch turns OFF, creating a brief period of time when both switches are ON.



During an open transfer, the first switch will turn OFF before the second switch turns ON, creating a period of time when neither source is connected. This period is commonly referred to as the neutral time.



You can set whether or not to **Allow Closed** transfers under the **Transfer Setup** item on the **ATS Setup** menu on the display interface. (See page 35 for details on these settings.) If the **Allow Closed** setting is **Yes**, the ATS will always seek to perform closed transfers. In order for a closed transfer to occur, the voltage and frequency for both sources has to be good; in addition, a closed transfer cannot occur if the two sources are not synchronized. The ATS monitors for both sources to be synchronized before transferring. If the time it takes for the sources to be synchronized exceeds the configured **Max Sync Time**, the ATS will perform an open transfer instead. During a closed transfer, the ATS also takes into account the time it takes for the switch to actuate, which creates a seamless transfer—non-UPS-protected equipment will not be interrupted and the UPS time on battery will be reduced, and in some cases, eliminated.

If the **Allow Closed** setting is **No**, the ATS will never perform closed transfers—it will always perform open transfers. (See page 35 for details on these settings.) During an open transfer, the first switch will turn OFF before the second switch turns ON, creating a period of time when neither source is connected. This period is commonly referred to as the neutral time. The neutral time is defined by the configurable **Open Xfer Time**.

Fuel monitoring/runtime calculation

Fuel monitoring is a unique feature of the InfraStruXure Power Generation System. Fuel level is monitored at the generator (if purchased through APC) and load is measured at the ATS. These measurements are used to calculate runtime, as explained in the following paragraph:

Fuel is monitored by a level sensor in the generator fuel tank (calibrated to the bottom of the fuel tank) that changes readings every ½-inch of fuel level change. From these fixed level points, the ATS counts the number of gallons or liters of fuel used (based on load over time) and subtracts this from the fixed level fuel amount to give an accurate estimate of fuel level. The remaining runtime is then calculated based on the fuel usage rate at the current load and the remaining fuel in the tank. Once a new fuel level point is reached, the value of the calculated fuel used is reset and the computation begins again.

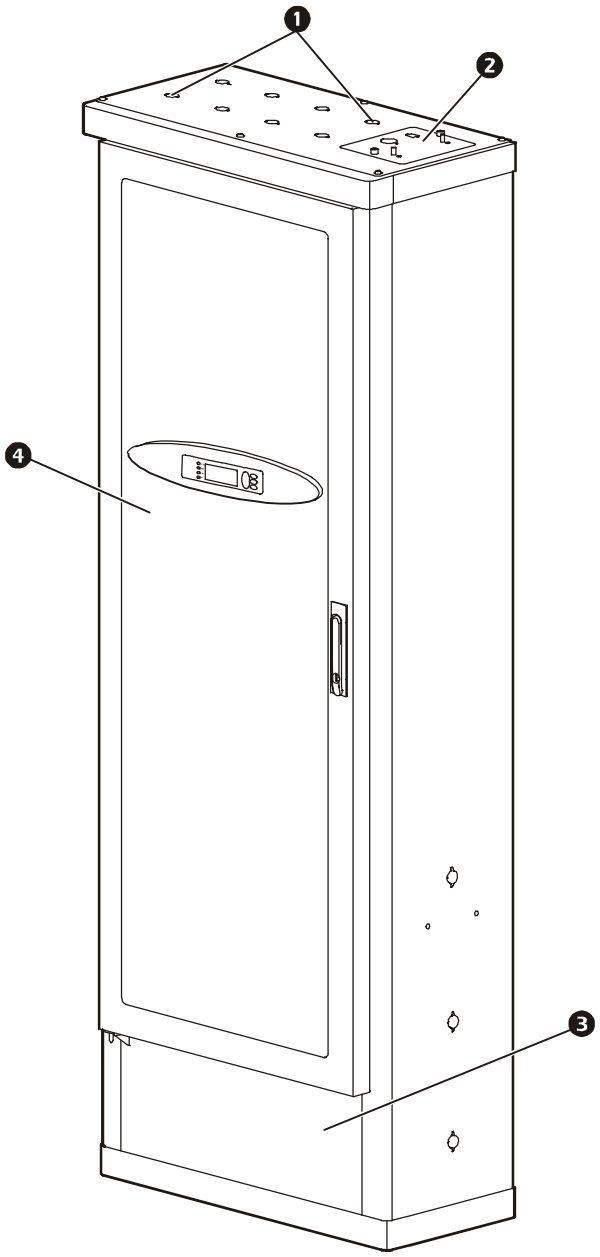
The **Fuel Level** and **Runtime Estimate** is displayed on the **Generator Status** screen on the ATS display interface, and you can set the following **Fuel Alarm Limits** in the **Alarms** menu of the display interface:

Percent Fill: If the amount of fuel as a percentage falls below this value, an alarm condition exists.

Runtime: If the estimated runtime falls below this value, an alarm condition exists.

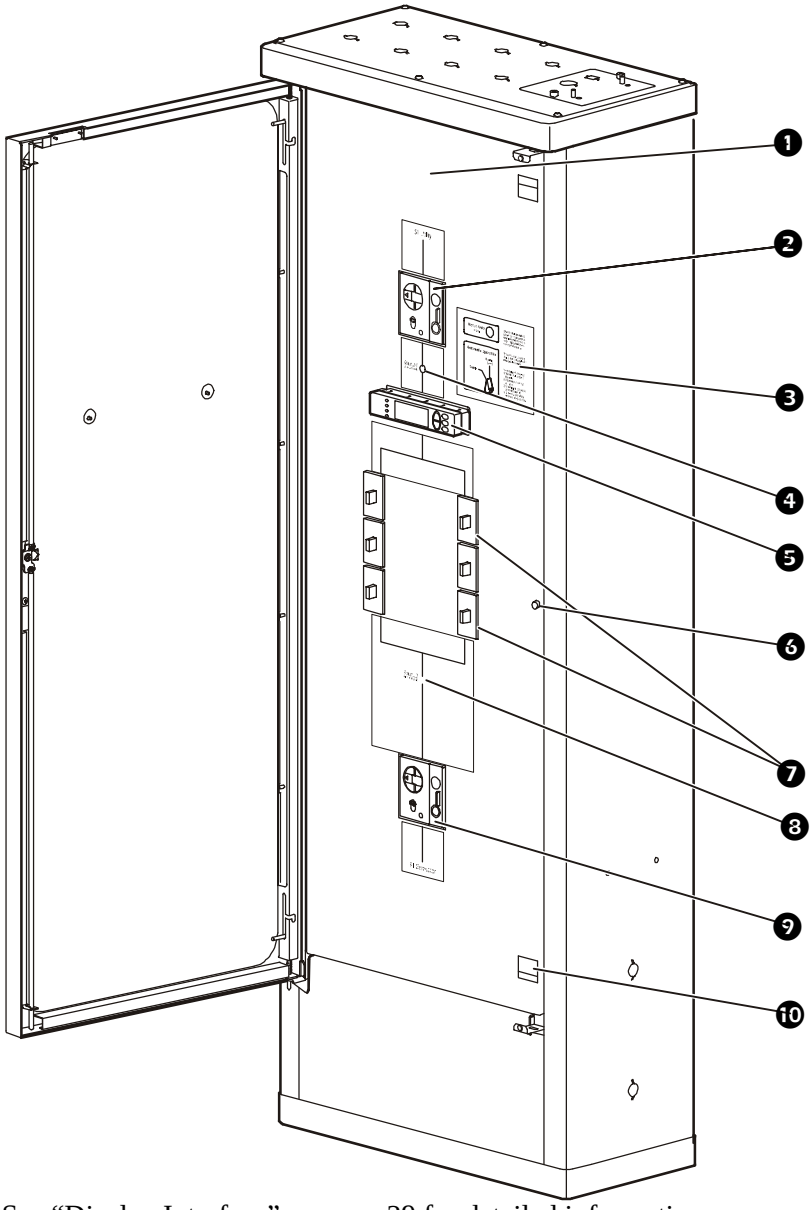
ATS with Power Distribution

Front view, door closed



1. Twenty **knockouts** are provided on the roof, the sides, and on the floor of the ATS for running utility mains and generator conductors and for distributing power to equipment in your data center. Connecting conduit to the ATS does not require drilling; use a knockout punch to enlarge a knockout, if necessary.
2. The **user connection plate** is connected to the ATS monitoring unit, and provides easy access to input contact, relay output, network, and EPO connections. Make connections from inside the enclosure, and route wires through the knockout provided on the plate. See “User connection plate” on page 16 for more information.
3. The **bottom access panel** can be removed for access to the panel board. Use a #2 Phillips screwdriver to remove the two M6 flat-head screws securing the panel to the enclosure.
4. The perforated steel **front door** has a Plexiglas plate protecting access to the switches, circuit breakers, and the display interface. If you want to access the display interface without opening the front door, you can remove the rectangle of Plexiglas covering the display interface. See page 67 for instructions.

Front view, door open



❶ The **dead front** provides access to the panel board for maintenance and wiring.

❷ The Source 1 input switch is controlled by the **Source 1 motorized switch.** See "Motorized switches" on page 15 for more information on the operation of this switch.

❸ The **automatic operation control panel** sets whether the generator is controlled automatically. See "Automatic operation control panel" on page 16 for more information**.**

❹ The **Source 1 lamp** is green when the Source 1 switch is ON (closed).

❺ The **display interface** provides a local interface for viewing status data, configuring settings, and operating the ATS. It has an LCD, five-button interface, basic status lights, and a beeper. See "Display Interface" on page 29 for detailed information on operation and the contents of each screen**.**

❻ The **captive screw** secures the dead front, and can be loosened with a Phillips or standard screwdriver.

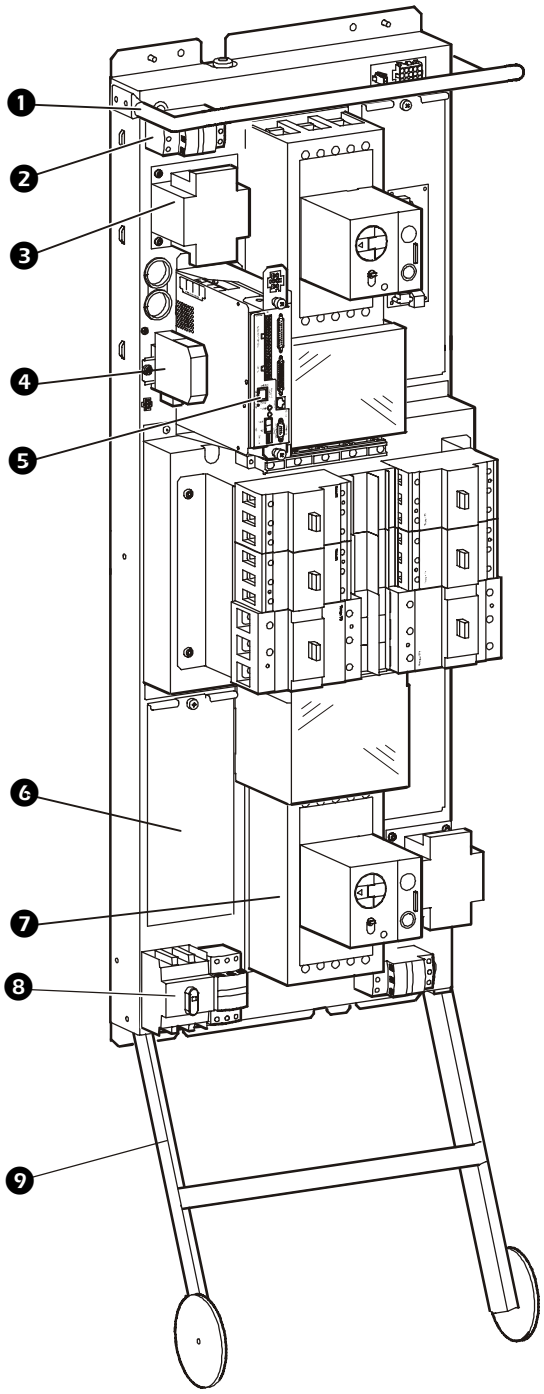
❼ **Sub-feed output breakers** power equipment in the data center. For detailed information on installing these breakers, see page 68.

❽ The **Source 2 lamp** is green when the Source 2 switch is ON (closed).

❾ The Source 2 input switch is controlled by the **Source 2 motorized switch**. See page 15 for more information on how to operate this switch.

❿ The **latches** open the dead front after the captive screw in the middle right side of the dead front is loosened with a Phillips or standard screwdriver.

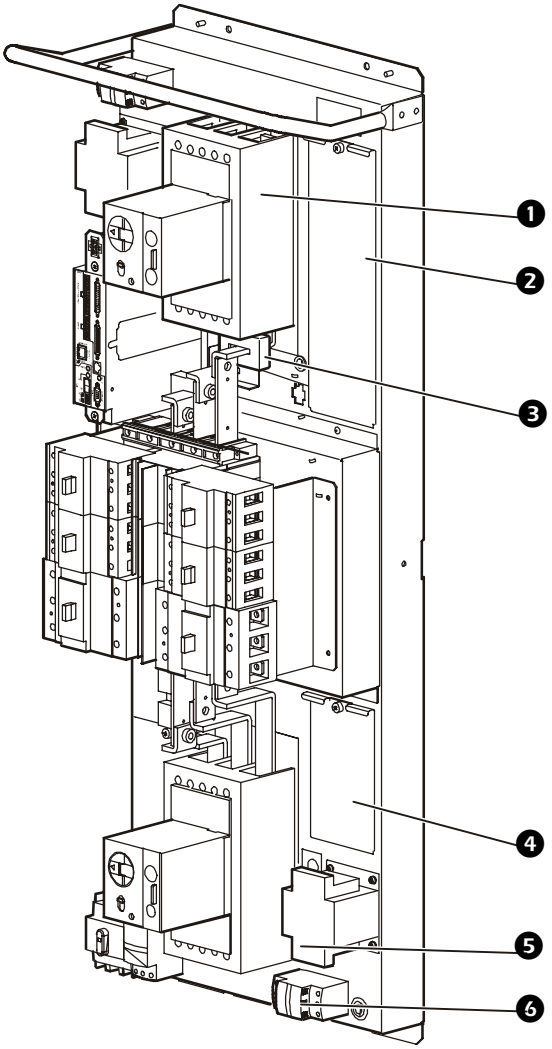
ATS panel board, left side



1. The **handle** aids the removal of the panel board from the ATS enclosure. Use at least two people to remove the panel board from the ATS enclosure. See the *InfraStruXure Power Generation System Installation Manual* for instructions.
2. Control power from Source 1 is supplied through the **Source 1 fuse block** to the Source 1 control transformer for powering the Source 1 motorized switch and the ATS monitoring unit.
3. The **Source 1 control transformer** outputs 120 VAC and 18 VAC to the Source 1 motorized switch, and the ATS monitoring unit. The transformer steps down 480 V or 208 V input.
4. The **communication converter** allows the generator and ATS to communicate.
5. The ATS has several monitoring boards that report to a central board assembly located in the **ATS monitoring unit**. See "ATS monitoring unit" on page 17 for detailed information on the ATS monitoring unit.
6. Behind this **access panel** is the ATS interface circuit board. Use a Phillips or standard screwdriver to remove the panel.
7. Input conductors from the generator connect to the **Source 2 input switch**. See the *InfraStruXure Power Generation System Electrical Installation Manual* for connection instructions.

   WARNING: Only a certified electrician should connect the generator to the ATS!
8. This **switch** and **fuse block** protects the 120VAC supply to the generator for the block heater and battery charger.
9. The **wheel assembly** on the panel board allows for easy removal of the panel board during unpacking and installation. Removing the panel board makes it easier to pull wires into the ATS.

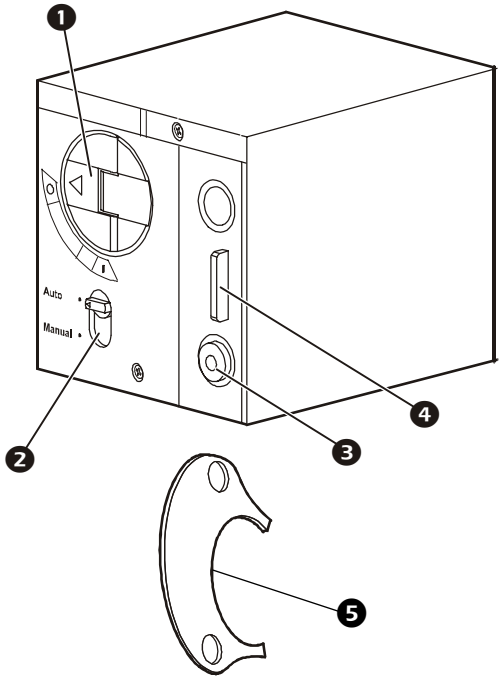
ATS panel board, right side



1. Input conductors from the utility mains connect to the **Source 1 input switch**. See the *InfraStruXure Power Generation System Installation Manual* for connection instructions. **WARNING: Only a certified electrician should connect power to the ATS!**
2. Behind this **access panel** are the volt-sensing circuit boards. Use a Phillips or standard screwdriver to remove the panel.
3. The **Source 1 current transformers** monitor the input current from each phase of the input from the utility mains. The data gathered from these current transformers is displayed on the *Total Load by Phase* screen, accessed through the *Load Meter* menu on the display interface.
4. Behind this **access panel** is the Source 2 volt-sensing (S2 PT) circuit board. Use a Phillips or standard screwdriver to remove the panel.
5. The **Source 2 control transformer** outputs 120 VAC and 18 VAC to the Source 2 motorized switch. The transformer steps down 480 V or 208 V input.
6. Control power from Source 2 is supplied through the **Source 2 fuse block** to the Source 2 transformer and powers the Source 2 motorized switch.

ATS Component Details

Motorized switches



❶ The **operating lever** indicates the present position of the switch [OFF (O), trip, or ON (|)]. This lever is also used to operate the switch manually. See “Emergency Manual Operation” on page 22 for proper operating procedures.

❷ Choose whether the motorized switch is controlling the input switch through the **selector switch**. Use only during emergency manual operation. See page 21 for more information.

❸ Pressing the **trip test button** immediately turns the switch to trip, and, when automatic operation is enabled, the operating lever swings to the OFF (O) position. **WARNING: Do not press this button while load is connected!**

❹ When the motorized switch is in the OFF (O) position, attach a lock-out tag to the **withdrawal prevention lock** for added safety.

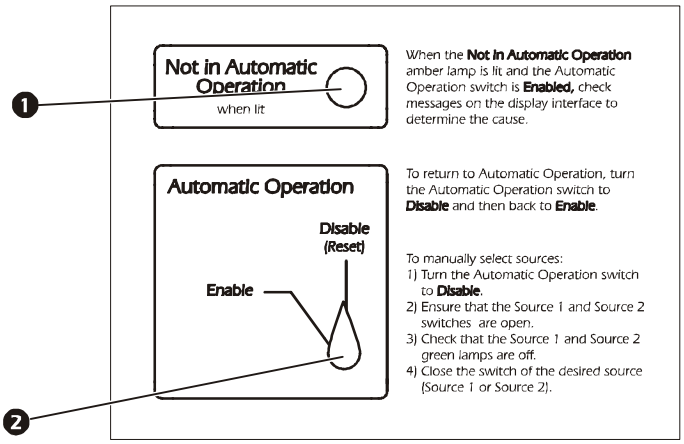
❺ The **operating lever key** is provided in the hardware bag with the ATS. Use the key during manual operation of the switch to easily control the operating lever.

DANGER

Do NOT operate the motorized switches without following the instructions in “Emergency Manual Operation” on page 22. Failure to follow proper procedures could cause personal injury or damage to the equipment.

Automatic operation control panel

For a discussion of Automatic Operation of the InfraStruXure Power Generation System, see "Automatic Operation" on page 19.

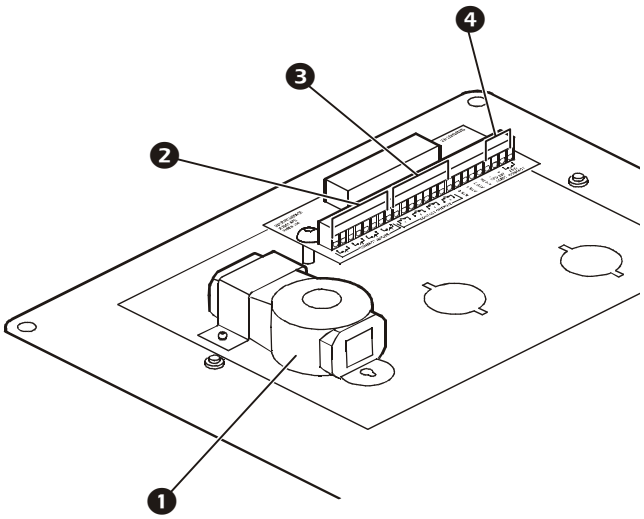

Not in Automatic Operation
when lit
When the Not in Automatic Operation amber lamp is lit and the Automatic Operation switch is Enabled, check messages on the display interface to determine the cause.
Automatic Operation
Disable (Reset)
Enable
To return to Automatic Operation, turn the Automatic Operation switch to Disable and then back to Enable.
To manually select sources:
1) Turn the Automatic Operation switch to Disable.
2) Ensure that the Source 1 and Source 2 switches are open.
3) Check that the Source 1 and Source 2 green lamps are off.
4) Close the switch of the desired source (Source 1 or Source 2).
1
2

❶ The **Not in Automatic Operation** LED is lit when the ATS is NOT in automatic operation, typically when the automatic operation switch is in the **Disable** position. However, in rare instances, the **Not in Automatic Operation** LED can be lit when the automatic operation switch is in the enable position. See page 21 for more information.

❷ Select whether the generator will automatically turn on after a loss of power using the **Automatic Operation** switch.

User connection plate

For a description and the location of the user connection plate, see number 2 on page 11. For clarity, the user connection plate in the illustration below is turned upside-down from its factory-installed position.



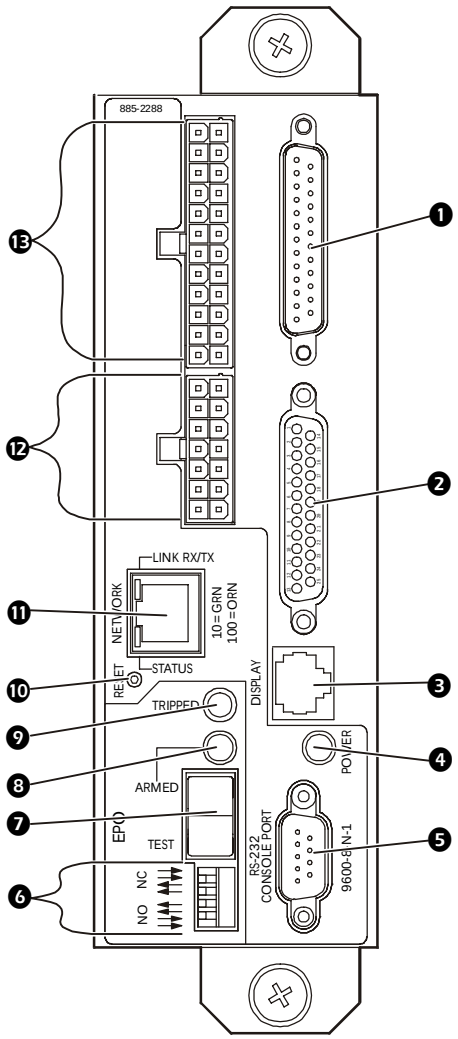
❶ Connect the ATS to the network or the InfraStruXure Manager through the **surge-protected ethernet port**. This port protects your network connection from power surges.

❷ The user connection plate has four **input contact connections** for monitoring Normally Open (NO) or Normally Closed (NC) dry contacts. See page 46 and page 61 for more information.

❸ The user connection plate has four **relay output connections** for connection of NO or NC dry contacts. See page 46 and page 61 for more information.

❹ Connect an Emergency Power-Off switch at one of three choices of EPO Connections (24VDC, 24VAC, or contact closure). See page 63 for more information.

ATS monitoring unit



❶ This port connects to the Source 2 volt-sensing (S2 PT) circuit board, Source 1 volt-sensing (S1 PT) circuit board, Source 1 current transformers, and distribution panel volt-sensing circuit board.

❷ This port connects to the ATS interface circuit board.

❸ The **display port** (RJ-45) connects the monitoring unit to the display interface.

❹ The **power LED** indicates whether the monitoring unit is receiving power.

❺ This **console port** is used to configure items relating to servicing and for communicating with the generator (see item 4 on page page 13). Use this port (DB-9) to connect a laptop computer to the monitoring unit using an appropriate communication cable (APC part number 940-0103).

❻ **EPO DIP switches** configure the EPO input for the type of EPO switch that is connected—Normally Open (NO) or Normally Closed (NC).

❼ When the **EPO Arm/Test rocker** is in the **Test** position, engaging the EPO switch will not cause the load to be powered off. When the rocker is in the **Armed** position, engaging the EPO switch turns OFF the ATS Source 1 and Source 2 switches and engages the generator's emergency stop button. When the EPO switch is engaged, the ATS Not in Automatic LED is lit. See page 64 for more information on testing the EPO switch.

❽ The EPO **Armed LED** is green when the rocker is in the **Armed** position. The LED is dark when the rocker is in the **Test** position.

❾ The EPO **Tripped LED** is red when the EPO switch is engaged (the EPO button is pressed), regardless of the state of the **EPO Arm/Test rocker**.

❿ The **reset button** resets the network processor; it does not reset the ATS or the monitoring unit.

⓫ This **network port** connects to the surge-protected ethernet port on the user connection plate. (See page 16 information on the surge-protected ethernet port.)

⓬ This port connects to the ATS interface circuit board.

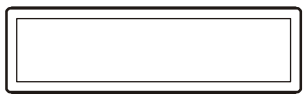
⓭ The optional **User/EPO Contacts** port is connected to the User Connection Plate in the roof of the ATS. The port allows for relay outputs (4), input contacts (4), and an EPO input (1). See page 16 for more information.

ATS label kit

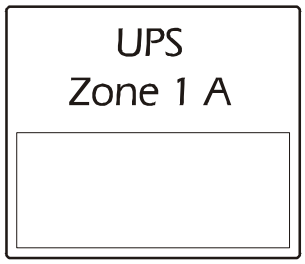
ATS Label—Place this label on the outside of the ATS enclosure to identify the ATS, and to associate it with the appropriate source 1 and source 2.

Source Label—Use a *Source 1* label at the primary utility mains breaker to identify the ATS that it is connected to. Use a *Source 2* label if you are connecting to a secondary utility mains breaker instead of a generator.

Generator Label—Use three of these labels at the generator to identify which ATS it is connected to. Place one label on each long side of the generator near the generator brand name labels, and place one label on the door where the generator controller is located.



Single-Pole Label—Use one of these labels with a single-pole breaker on the ATS distribution panel to identify to what the breaker is feeding power. Use the marker (included) to write on the label.



Three-Pole Breaker Label—Use one of these labels with a three-pole breaker on the ATS distribution panel to identify to what the breaker is feeding power. Use the marker (included) to write notes on the lower portion of the label. The labels are customized for typical components in an InfraStruXure system. Blank labels are also included for components that are not pre-marked on the included labels.

Front Bezel Label—If you are not using a generator for source 2, use one of these labels to replace the *Generator Power System* label on the left-hand side of the bezel. You can use either the *Automatic Transfer Switch* or the *Standby Power System* label to describe your system.

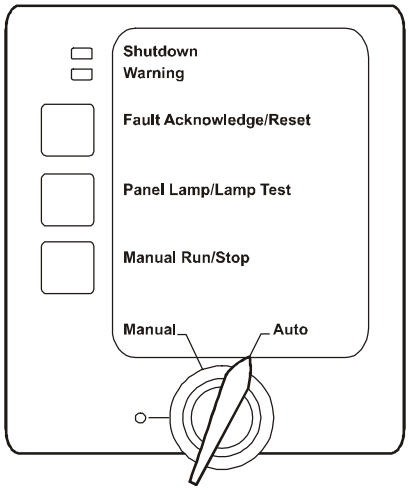
ATS Deadfront Source Label—Use these alternate labels for source 1 and source 2 if you do not want *Utility Mains* and *Generator* to describe your sources. Using these labels, you can use *Primary* and *Secondary* or *Normal* and *Alternate* to describe source 1 and source 2.

Operation

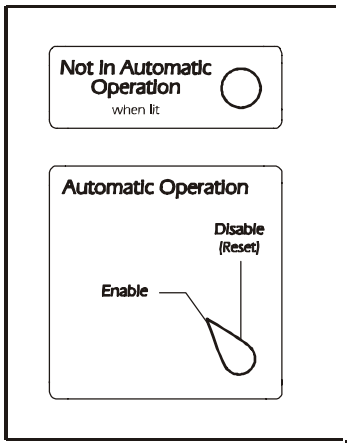
Automatic Operation

How to place the InfraStruXure Power Generation System in automatic operation

1. Ensure that utility mains is available. The generator will be signaled to start if utility mains is not available.
2. Ensure that the ○**/Manual/Auto** switch on the generator control panel is in the **Auto** position.



3. Set the ATS Automatic Operation switch to **Enable**.



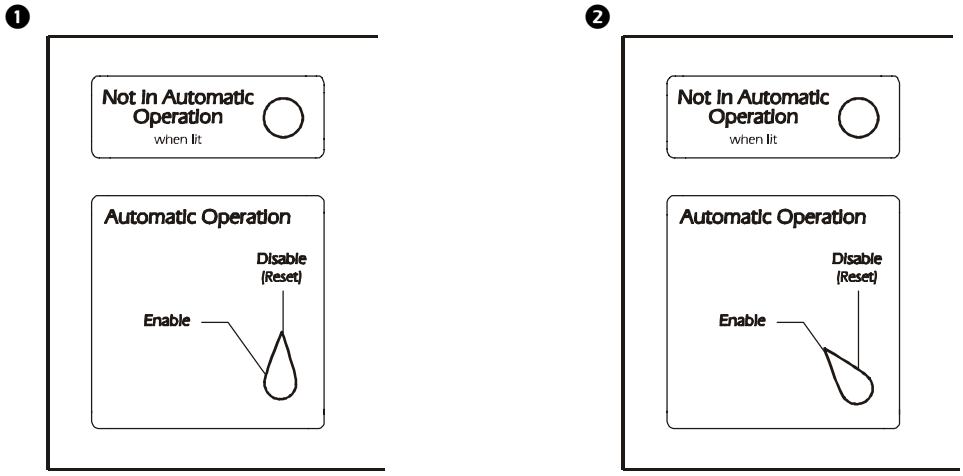
4. Check that the **Not In Automatic Operation** LED is not lit. See page 21 for information on uncommon behavior of this LED.

"How the InfraStruXure Power Generation System Operates," beginning on page 6, provides a detailed summary of automatic operation of the InfraStruXure Power Generation System.

How to reset automatic operation on the ATS and on the generator

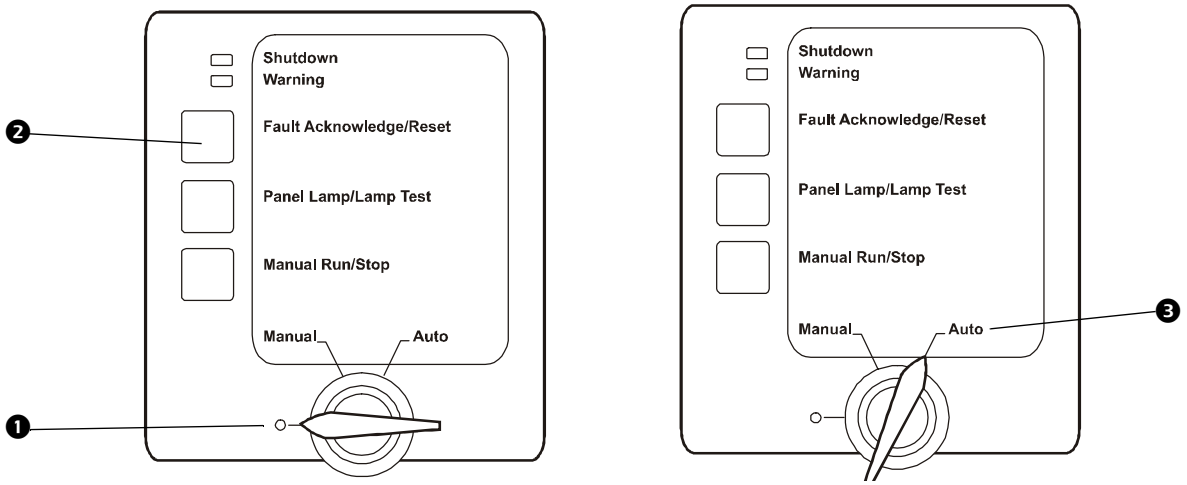
Resetting automatic operation on the ATS. If the **Not in Automatic Operation** LED is lit and the **Automatic Operation** switch is in the **Enable** position, you need to reset automatic operation after the event that caused this condition has been corrected. (See page 21 for a detailed description the events that might lead to this condition.) You can also clear certain alarms by resetting automatic operation on the ATS. See “Clearing latched alarms” on page 44 for more information.

To reset automatic operation on the ATS, set the **Automatic Operation** switch to **Disable (❶)** and then back to **Enable (❷)**.



Resetting automatic operation on the generator. If the ATS display interface reports a generator shutdown alarm and the Alarm LED is red, you must reset automatic operation on the generator to clear the alarm (the Shutdown LED on the generator control panel will also be red). Events that lead to this condition include engaging the data center EPO switch and engaging the E-Stop button on the generator. If any EPO was engaged, the switch must be disengaged before automatic operation can be reset. If shutdown was not caused by EPO, contact APC service (see “Service” on page 82). To reset automatic operation on the generator:

❶ Set the ◯**/Manual/Auto** switch on the generator control panel to ◯. ❷ Press the **Fault Acknowledge/Reset** button on the generator control panel. ❸ Set the ◯**/Manual/Auto** switch on the generator control panel back to **Auto**.



Problem—loss of automatic operation

Typically, the **Not In Automatic Operation** LED tracks the state of the **Automatic Operation** switch (i.e., the LED is lit when the **Automatic Operation** switch is in the **Disable** position). If the **Not In Automatic Operation** LED is lit while the **Automatic Operation** switch is in the **Enable** position, check messages on the display interface to determine the cause—one of the following conditions exist:

1. The ATS attempted to actuate either the Source 1 or Source 2 switch, and could not.

   When a switch cannot actuate, one of the four following actions cannot take place:

   – The Source 1 switch cannot turn ON (Close)

   – The Source 1 switch cannot turn OFF (Open)

   – The Source 2 switch cannot turn ON (Close)

   – The Source 2 switch cannot turn OFF (Open)

   When the ATS cannot actuate a switch, it will attempt several more times before stopping. There are two cases of this condition:

   – *The load is receiving supply from utility mains, and the Source 1 switch trips.*
   When the Source 1 switch trips, the ATS will try to re-close the switch. If the switch cannot be closed the ATS will start the generator and then close the Source 2 switch. The load will be powered by the generator and the ATS will be in *Not in Automatic Operation* mode until it is reset (see page 20).

   – *The load is receiving supply from the generator, and the Source 2 switch trips.*
   When the Source 2 switch trips, the ATS will try to re-close the switch, and after several attempts one of two things will happen, depending upon whether utility mains is available.

     • If utility mains is not available, the generator will continue to run until utility mains is available. Once utility mains is available, the ATS will switch to utility mains and then turn off the generator. Utility mains will supply power to the ATS, and the ATS will be in *Not in Automatic Operation* mode until automatic operation is reset (see page 20).

     • If utility mains is available, the ATS will switch to utility mains and then turn off the generator. Utility mains will supply power to the ATS, and the ATS will be in *Not in Automatic Operation* mode until automatic operation is reset (see page 20).

2. The data center EPO switch that is connected to the ATS EPO interface was engaged.

   When the EPO switch is engaged, the ATS Source 1 and Source 2 switches are tripped open, and the generator's emergency stop signal is engaged—the ATS is no longer supplying output power. The ATS immediately goes into *Not in Automatic Operation* mode. The ATS stays in *Not in Automatic Operation* mode until the system is reset. To reset the system, disengage the data center EPO switch and reset automatic operation on the generator and on the ATS (see page 20).

Emergency Manual Operation

Warning—before you operate the ATS manually

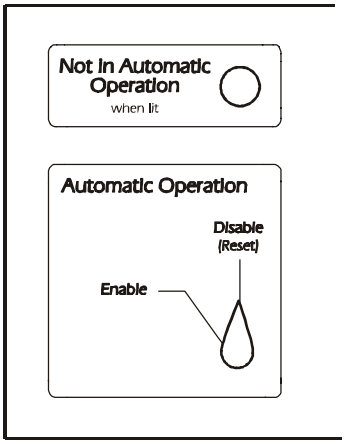
The procedures in this section only apply to situations where automatic operation through the ATS is impossible. One example of such a situation is if the ATS monitoring unit were not functioning. If automatic operation through the ATS is impossible, and you must power your load from the generator, follow the instructions in “How to power the load from the generator” on page 23.

Only operate the ATS switches manually when automatic operation is disabled. If automatic operation is enabled, the ATS will attempt to actuate the switches to return to the preferred source.

All transfers performed when automatic operation is disabled must be open transfers—both switches must be OFF before turning ON the desired source’s switch. Attempting a closed transfer will damage equipment.

How to power the load from the generator

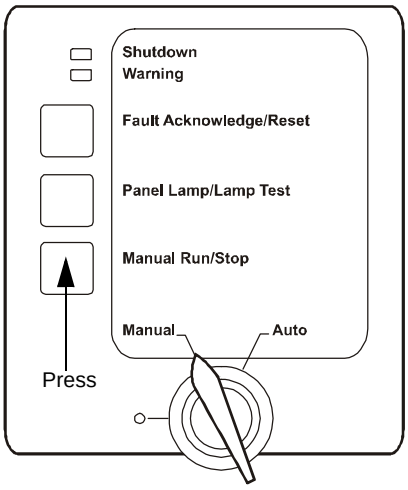
1. Place the ATS **Automatic Operation** switch in the **Disable** position.



2. Ensure that the Source 2 switch on the ATS is OFF (○).

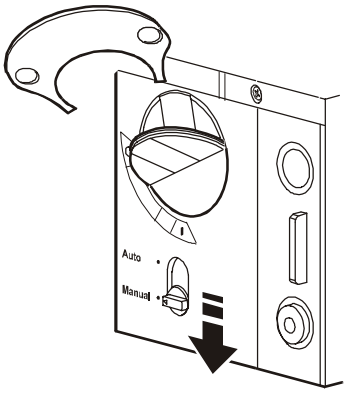
3. At the generator:
   a. Place the ○**/Manual/Auto** switch on the generator control panel in the **Manual** position.
   b. Press the **Manual Run/Stop** button on the generator control panel, if you need to start the generator.

      Pressing this button activates the engine control system and the starting system. The starter will begin cranking and, after a few seconds, the engine should start.



4. Turn the Source 1 switch on the ATS to OFF (○):
   a. Set the selector switch on the Source 1 switch to **Manual**.

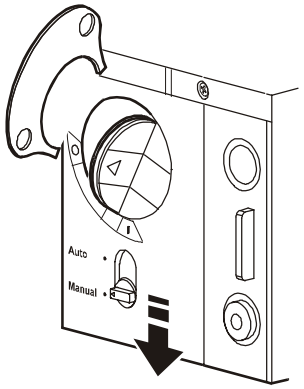
      The operating lever will swing out when the selector switch is in **Manual**.
   b. Turn the Source 1 switch counterclockwise to OFF (○). You can use the operating lever key (provided), for easier operation.



5. Turn the Source 2 switch to ON (┃):
   a. Set the selector switch on the Source 2 switch to **Manual**.

      The operating lever will swing out when the selector switch is in **Manual**.

   b. Turn the Source 2 switch clockwise to ON (┃). You can use the operating lever key (provided), for easier operation.



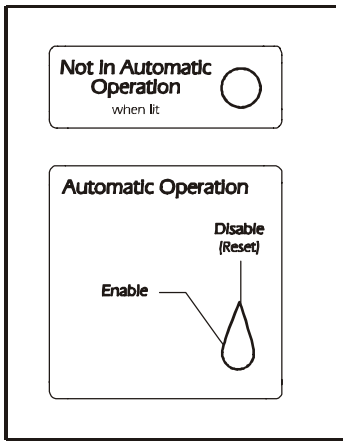
   c. Close the operating levers on both the Source 1 and Source 2 switches, and set the selector switches back to **Auto** to lock the switches in place.

6. Ensure that the generator is powering the load by checking that the downstream UPS is no longer on battery operation or that other load equipment is operating.

7. Check the alarms visible on the control panel of the generator and check the troubleshooting section of this manual for possible problems.

How to return to powering the load from utility mains

1. Ensure that the ATS **Automatic Operation** switch is in the **Disable** position.



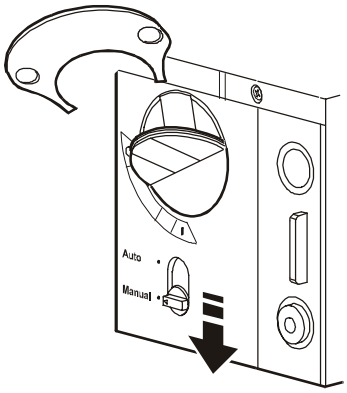
2. Ensure that the Source 1 switch on the ATS is OFF (O).

3. Turn the Source 2 switch on the ATS to OFF (O):

   a. Set the selector switch on the Source 2 switch to **Manual**.

      The operating lever will swing out when the selector switch is in **Manual**.

   b. Turn the Source 2 switch counterclockwise to OFF (O). You can use the operating lever key (provided), for easier operation.

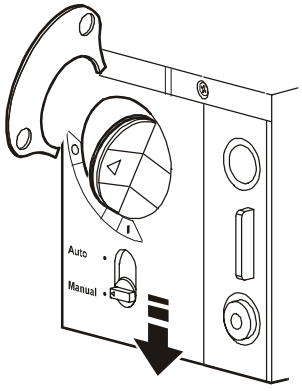


4. Turn the Source 1 switch on the ATS to ON (|):

   a. Set the selector switch on the Source 1 switch to **Manual**.

      The operating lever will swing out when the selector switch is in **Manual**.

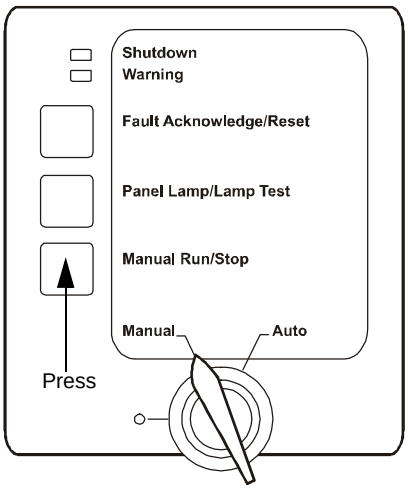
   b. Turn the Source 1 switch clockwise to ON (|). You can use the operating lever key (provided), for easier operation.



   c. Close the operating levers on both the Source 1 and Source 2 switches, and set the selector switches back to **Auto** to lock the switches in place.

5. Turn off the generator by following this procedure:
   a. Ensure that the **O/Manual/Auto** switch on the generator control panel is in the **Manual** position.
   b. Press the **Manual Run/Stop** button on the generator control panel.

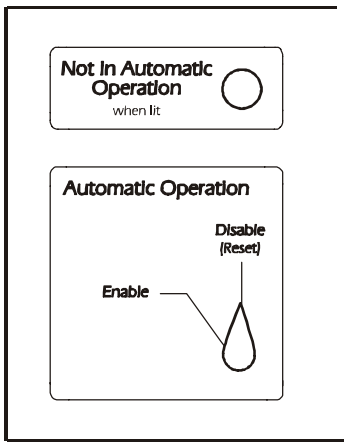
      Pressing this button causes the generator to complete its normal shutdown sequence.



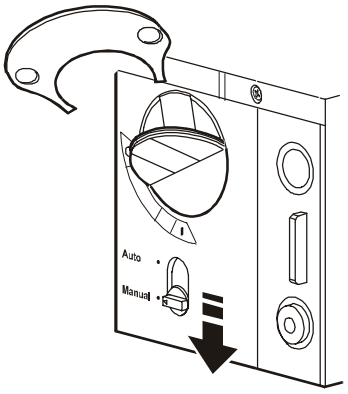
Total Power Off

To reduce risk of electric shock or injury to persons, disconnect all sources of supply before servicing by following this procedure:

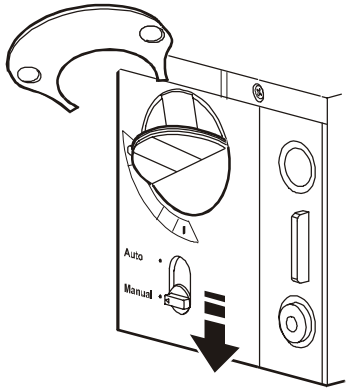
1. Set the ATS **Automatic Operation** switch to **Disable**.



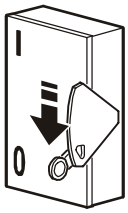
2. Set the Source 1 switch on the ATS to OFF (O):
   a. Set the selector switch on the Source 1 switch to **Manual**.
      The operating lever will swing out when the selector switch is in **Manual**.
   b. Turn the Source 1 switch counterclockwise to OFF (O). You can use the operating lever key (provided), for easier operation.



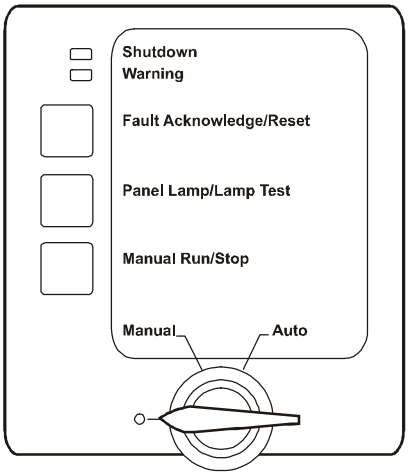
3. Set the Source 2 switch on the ATS to OFF (O):
   a. Set the selector switch on the Source 2 switch to **Manual**.
      The operating lever will swing out when the selector switch is in **Manual**.
   b. Turn the Source 2 switch counterclockwise to OFF (O). You can use the operating lever key (provided), for easier operation.



4. Set the main Source 1 circuit breaker to OFF (O).



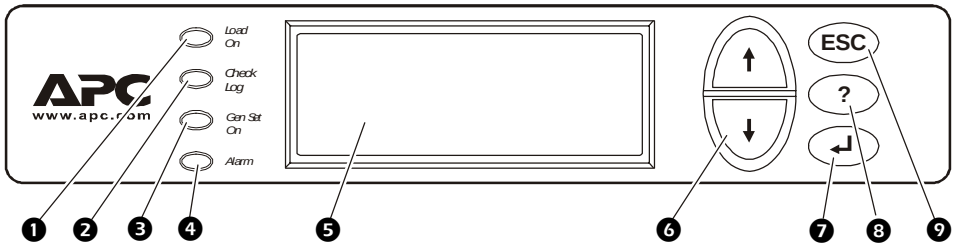
5. Set the main Source 2 circuit breaker to OFF (O). If Source 2 is a generator, set the generator control switch to OFF (O), or set the generator control switch to **Manual**, if OFF is not an option.



Display Interface

Overview

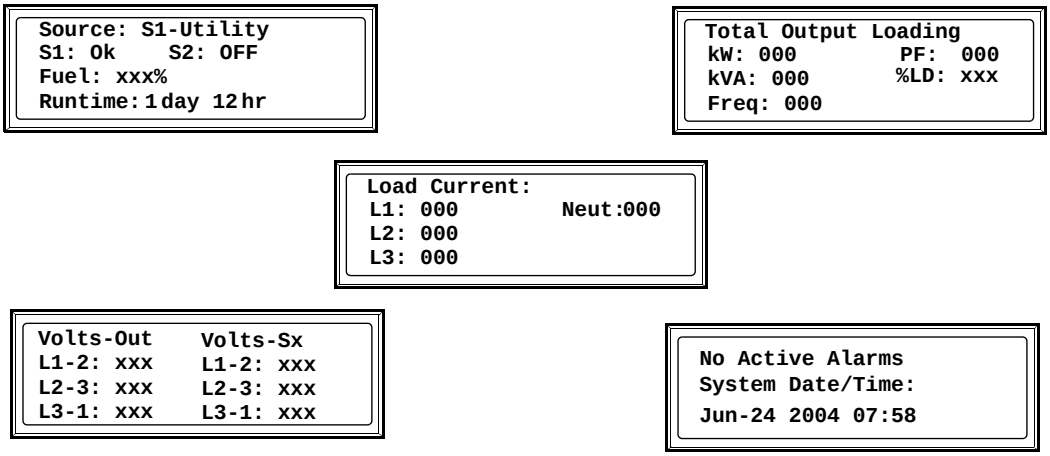
You can use the display interface to configure settings, set alarm thresholds, and provide audible and visual alarms.



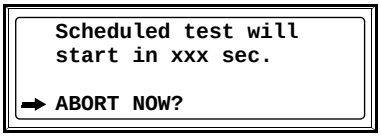
❶	Load On LED	When green, all output phases are within the limits specified by the output alarm limit thresholds.
❷	Check Log LED	When yellow, at least one new alarm condition has been detected.
❸	Gen Set On LED	When green, the generator is running.
❹	Alarm LED	When red, an alarm condition exists.
❺	LCD	View alarms, status data, instructional help, and configuration items.
❻	Up and Down navigation keys	Selects menu items and accesses information.
❼	ENTER key	Opens menu items and inputs changes to system parameters.
❽	HELP key	Launches context-sensitive help. Press the HELP key for information about each item on the screen and for instructions on how to perform certain tasks.
❾	ESC key	Returns to previous screen displayed.

Top-level status screens

After displaying a brief start-up screen after system start-up, the display interface scrolls automatically and continuously through five screens of basic status information. Press the Up and Down arrow keys to interrupt the automatic scrolling to view a specific status screen.

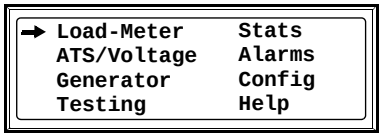


If you have scheduled tests, each time a self-test is commencing, the scheduled test screen (shown below) is displayed. To cancel this instance of the self-test, press the ENTER key when the selector arrow rests on the ABORT NOW? option.



Top-level menu screen

On any top-level status screen, press the ENTER key to open the top-level menu screen.



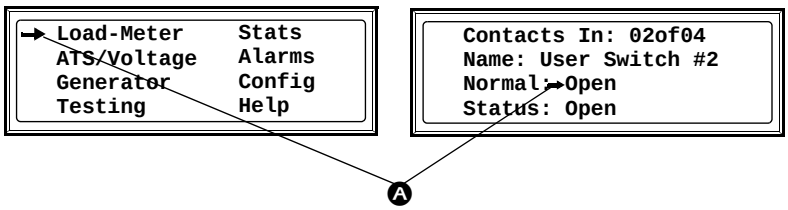
Note

If the display interface is inactive for the time specified as the **Time-out** setting, the interface reverts to the initial basic monitoring screens.

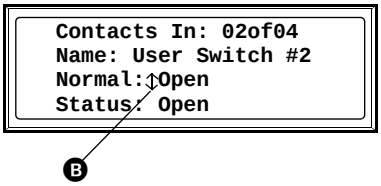
For descriptions of the top-level menu choices, see the individual sections starting on page 32.

Navigating through screens

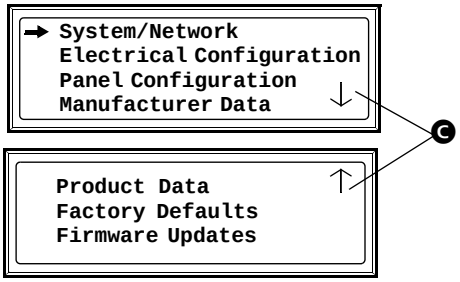
To open any screen, press the Up and Down arrow keys until the selector arrow (Ⓐ) rests next to your desired selection. Press the ENTER key to view the selected screen.



When configuring settings, press the Up and Down arrow keys until the selector arrow (Ⓐ) rests next to the setting you want to change, and press the ENTER key. If the setting is a list of choices, an input arrow (Ⓑ) will appear next to the setting. Press the Up and Down arrow keys until your desired change is listed. Press the ENTER key to select the setting.



On some screens, continue arrows (Ⓒ) indicate that there are additional screens to view in the category. Press the Up or Down arrow key to view the additional screens.



Password-protected screens

When configuring or changing settings, you will be prompted for your password. To enter your password:

1. Press the Up or Down arrow key until the correct letter is displayed, and then press the ENTER key.

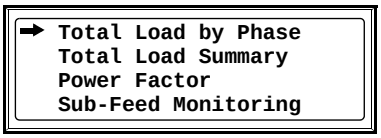
Note

After you press the ENTER key, the character you entered is displayed as an asterisk and the input arrow moves to the next space for you to select the next password character.

2. Press the ENTER key twice after you enter your password.

See “System Password” on page 45 to change your password.

Load-Meter



Total Load by Phase

For each phase (**L1**, **L2**, **L3**) the following is displayed:

kVA The apparent power provided, in kilovolt amps.

Iout The output RMS load current.

%LD The load as a percentage of the maximum allowable load.

Total Load Summary

For the total load supported, the following is displayed:

kW The active power drawn by the load, in kilowatts.

kVA The apparent power provided, in kilovolt amps.

Freq The frequency, in hertz.

PF Power factor, the ratio between active power and apparent power (kW/kVA), which affects the power available to the load.

%LD The load as a percentage of the maximum allowable load.

Power Factor

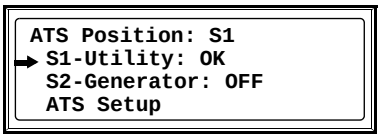
Displays the following power factor data for each phase (**L1**, **L2**, **L3**):

kVA The apparent power provided, in kilovolt amps.

kW The active power drawn by the load, in kilowatts.

PF The ratio between active power and apparent power (kW/kVA), which affects the power available to the load.

ATS/Voltage



ATS Position

One of the following options is displayed to describe the selected source:

S1	The Source 1 switch is ON (closed). Source 1 is connected to the output.
S2	The Source 2 switch is ON (closed). Source 2 is connected to the output.
NEUT	The Source 1 and Source 2 switches are OFF (open). Neither source is connected to the output.
S1&S2!	The Source 1 and Source 2 switches are ON (closed). This is an alarm condition.

S1-Utility

One of the following is displayed to describe the condition of the input from Source 1.

OK	Source 1 is acceptable, as defined in the **Transfer Points** menu. See page 35.
BAD	Source 1 is not acceptable, as defined in the **Transfer Points** menu. See page 35.

Press the ENTER key when the selector arrow rests at the **S1-Utility** item to display the following:

L1-2, L2-3, L3-1	The Source 1 line-to-line input voltage in volts (V).
L1, L2, L3	The Source 1 line-to-neutral input voltage in volts (V). These readings are only displayed on WYE systems.
Frequency	The frequency of the utility mains input, in hertz (Hz).
Qual	Describes the quality of the input from Source 1. One of the following conditions is displayed: • **Source Good**: The source is acceptable, as defined in the **Transfer Points** menu. • **Low Voltage**: The input voltage is below the configured **Low** voltage **Transfer Point** on one or more of the phases. • **High Voltage**: The input voltage exceeds the configured **High** voltage **Transfer Point** on one or more of the phases. • **Phase Imbalance**: The percent voltage difference between two phases, as defined by the **Phase Balance** setting in the **Transfer Points** menu, has been exceeded. • **Freq Range**: The frequency is outside the configured **Freq** range, as defined in the **Transfer Points** menu. • **Bad Rotation**: The phase rotation does not match the configured **Phase Sequence**, as defined in the **Transfer Points** menu.
Phase Sequence	Lists the phase rotation of the Source 1 input.

S2-Generator

One of the following is displayed to describe the condition of the input from Source 2.

OK	Source 2 is acceptable, as defined in the **Transfer Points** menu. (The generator is running.)
OFF	The generator is not running.
BAD	Source 2 is not acceptable, as defined in the **Transfer Points** menu, while the ATS is commanding the generator to run.

Press the ENTER key when the selector arrow rests at the **S2-Generator** item to display the following:

L1-2, L2-3, L3-1	The Source 2 line-to-line input voltage in volts (V).
L1, L2, L3	The Source 2 line-to-neutral input voltage in volts (V). These readings are only displayed on WYE systems.
Frequency	The frequency of the Source 2 input, in hertz (Hz).
Qual	Describes the quality of the input from Source 2. One of the following conditions is displayed: • **Source Good**: The source is acceptable, as defined in the **Transfer Points** menu. • **Low Voltage**: The input voltage is below the configured **Low** voltage **Transfer Point** on one or more of the phases. • **High Voltage**: The input voltage exceeds the configured **High** voltage **Transfer Point** on one or more of the phases. • **Phase Imbalance**: The percent voltage difference between two phases, as defined by the **Phase Balance** setting in the **Transfer Points** menu, has been exceeded. • **Freq Range**: The frequency is outside the configured **Freq** range, as defined in the **Transfer Points** menu. • **Bad Rotation**: The phase rotation does not match the configured **Phase Sequence**, as defined in the **Transfer Points** menu.
Phase Sequence	Lists the phase rotation (e.g. A-B-C) of the Source 2 input.

ATS Setup

Press the ENTER key when the selector arrow rests at the **ATS Setup** item to change the following settings:

Transfer Points At what point when sensing the voltage you would transfer to the other source. Based on voltage and frequency.

- **S1-Utility**: The input voltage reading for Source 1.
- **Low**: The low voltage limit that causes the ATS to switch from Source 1 to Source 2. Press the ENTER key to change this setting.
- **High**: The high voltage limit that causes the ATS to switch from Source 1 to Source 2. Press the ENTER key to change this setting.
- **Other Settings**: The settings on this screen determine when the source is OK, and define the quality of the source. Press the ENTER key when the selector arrow rests at this item to change the following settings, or thresholds:
  - **Freq**: The frequency cannot vary beyond this configured range (+/– x.xx Hz).
  - **Phase Balance**: The percent voltage difference between two phases cannot exceed this configured setting (%).
  - **Phase Sequence**: The phase rotation (default is A-B-C) must match this configured setting.

Transfer Setup The following settings can be changed in this menu:

- **Open Xfers**: Defines the how long BOTH the Source 1 and Source 2 switches will be OFF (open) during an open transfer. See page 8 for a definition of open transfers.
- **Allow Closed**: Enables/disables closed transfers. See page 8 for a definition of closed transfers.
- **Max Sync**: The maximum time the ATS attempts a closed transfer before it performs an open transfer.
- **ATS Delay Settings**: The time delay settings that affect transfers and re-transfers.
  - **Gen Start**: The amount of time between when the generator receives a start signal and when the generator starts (default is 0).
  - **Line Stable:** If the ATS switches to Source 2 after a failure in Source 1, and Source 1 is restored, the **Line Stable** setting is the amount of time (in seconds) that Source 1 has to be good for before returning to Source 1 (default is 3 minutes).
  - **Min on Gen**: The minimum time that the generator has to run before the ATS re-transfers to utility mains (default is 15 minutes).

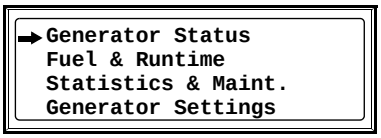
ATS Blocking

- **Transfer Blocking**: Defines conditions that will prevent the ATS from transferring from Source 1 to Source 2. The following is displayed on the Transfer Blocking screen:
  - **Block Transfer**: Lists configured input contacts that keep a transfer from occurring.
  - **Map**: Choose from the following input contacts that will block a transfer:
    C1: Contact 1
    C2: Contact 2
    C3: Contact 3
    C4: Contact 4
  - **Apply Now**: After you have made changes on this screen, choose this option and press the ENTER key to save your changes.
- **Retransfer Blocking**: Defines conditions that will prevent the ATS from transferring from Source 2 to Source 1. The following is displayed on the Retransfer Blocking screen:
  - **Block Re-Transfer**: Lists configured input contacts that keep a re-transfer from occurring.
    Map: Choose from the following input contacts that will block a re-transfer:
    C1: Contact 1
    C2: Contact 2
    C3: Contact 3
    C4: Contact 4
  - **Apply Now:** After you have made changes on this screen, choose this option and press the ENTER key to save your changes.
- **Gen Start Blocking**: Defines input contacts that will prevent the generator from starting because of a line failure:
  - **Block Gen Start**: Lists configured input contacts that prevent the generator from starting.
  - **Map**: Choose from the following input contacts that will block the generator from starting:
    C1: Contact 1
    C2: Contact 2
    C3: Contact 3
    C4: Contact 4
  - **Apply Now:** After you have made changes on this screen, choose this option and press the ENTER key to save your changes.

Other Settings

- **S1 Name**: Create a unique name for Source 1 (maximum of 9 characters). The default is *Utility.*
- **S2 Name**: Create a unique name for Source 2 (maximum of 9 characters). The default is *Generator.*
- **Preferred**: Displays the preferred source (Source 1).

Generator



Generator Status

The following items are available on this menu:

Generator Status One of the following conditions is displayed to describe the **Gen State:**

- **Off**: The generator is not running.
- **Cranking**: The generator is starting.
- **Running**: The generator is running.
- **Idle**: The generator is running, but not powering the load.
- **E-Stop**: The Emergency Power-Off switch has been actuated on the generator or ATS.
- **Fault**: The generator is unable to start.
- **No Com**: The ATS has lost communication with the generator.

The **Mode Sw** is the position of the generator's ○**/Manual/Auto** switch. The switch must be in **Auto**, for the generator to be started based on the state of the run/stop contact. **Auto**, **Manual**, or **Off** is displayed to describe the position of the switch.

The following settings can be accessed through this menu:

- **Engine Run**: This is the current state of the run/stop contact, which signals the generator's engine to start and stop. The state can be **Run** or **Off**. Automatic control of this signal is disabled when the **Not in Automatic Operation** LED on the ATS is lit.
- **Engine Parameters**: View the following measured data related to the generator's engine operation:
  - Battery Voltage
  - Engine RPM
  - Oil Pressure
  - Coolant Level
  - Coolant Temperature
  - Oil Level

Fuel & Runtime The following are displayed on this screen:

- **Type**: The type of fuel that the generator uses (diesel).
- **Tank Size**: The size of the fuel tank on the generator (in gallons).
- **Fuel Level**: The percentage of fuel left in the generator fuel tank.
- **Runtime Estimate**: How much time (xx days zz hours) the generator can run based on the fuel level and load, and the load value, in kW, used to calculate runtime.

Statistics & Maint.

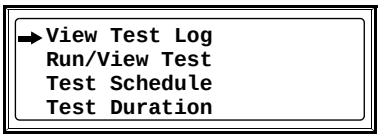
- **Lifetime Statistics**: Scroll through a list of items that accumulate over the life of the generator, including:
  - Last Maintenance Date
  - Engine Starts
  - Total kWh
  - Total Runhours

- **Maintenance Record**: Scroll through a list of items that accumulate after the maintenance record is reset, including:
  - Last Maintenance Date
  - Operating Days
  - Engine Starts
  - Total kWh
  - Total Runhours
- **Next Maintenance**: View the month and year of the next scheduled maintenance and the number of days until the scheduled maintenance, and reset the maintenance record so that the data in the menu, **Maintenance Record**, is reset to zero.

Generator Settings The following settings are accessible through this screen:

- **Operating Settings**
  - Start Delay — The amount of time that the generator waits after the start signal is initiated before the generator starts and powers the load. (Configurable on the generator control panel.)
  - Stop Delay — The amount of time between when the start signal is removed and when the generator stops. (Configurable on the generator control panel.)
  - Crank Settings — The following settings can be changed in the generator service menus by generator service personnel.
    - **Crank**: Whether the crank cycle is enabled. If the crank cycle is not enabled, the generator will attempt to start until the battery dies.
    - **Crank Cycles**: The number of crank cycles that the generator will go through when attempting to start the generator. The default setting is three.
    - **Crank Time**: The amount of time that the generator will crank during a crank cycle. The default setting is 15 seconds.
    - **Rest Time**: The amount of time that the generator will rest after it cranks during a crank cycle. The default setting is 15 seconds.
- **Manufacturer Data**
  - Fuel System — The type of fuel that the generator uses (default is diesel).
  - Tank Size — The size of the fuel tank on the generator (in Gallons).
  - Final Assy Date — Date that the generator was assembled at the factory.
  - Model Number — Generator model number from Cummins®.
  - GenSet S/N — The serial number of the generator.
  - Voltage Config — Nominal input voltage (208 V or 480 V).
  - Alternator Freq — Nominal frequency setting of the alternator output (50 or 60 Hz).
  - Gen kW Rating — The power rating of the generator (80 kW, 125 kW, or 200 kW).
- **Gen Output Adjust**
  - Voltage — Displays the desired alternator output voltage (configurable on the generator control panel).
  - Frequency — Displays the desired alternator output frequency (configurable on the generator control panel).

Testing



View Test Log

Displays all logged test results in a scrolling list. For each item in the list, the screen lists the **Gen Start** test and the **Load Test** results with a date and time stamp of when the test occurred.

Run/View Test

Use this menu to run a test now, or to view a test that is in progress.

Engine Start Test

If a test is in progress, the screen displays the **Test Progress** and the time remaining in the test. If you want to stop the test, select the **ABORT NOW?** item on this screen and press the ENTER key.

If you want to run a start test now, select **Run Test Now** from the confirmation screen, and then press the ENTER key. The test will run based on the parameters set on the **Test Duration** menu. If you do not want to run a start test now, choose **No** from the confirmation screen, and then press the ENTER key.

System Load Test

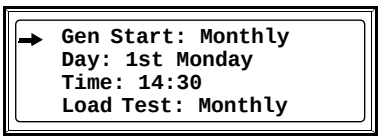
If a test is in progress, the screen displays the **Test Progress** and the time remaining in the test. If you want to stop the test, select the **ABORT NOW?** item on this screen and press the ENTER key.

If you want to run a load test now, select **Run Test Now** from the confirmation screen, and then press the ENTER key. The test will run based on the parameters set on the **Test Duration** menu. If you do not want to run a load test now, choose **No** from the confirmation screen, and then press the ENTER key.

Test Schedule

Use this menu to schedule a test in the future.

Define Schedule Set the test schedule by changing the following parameters:



- **Gen Start**: Choose when to perform a generator start test. Choices are **Never**, **Monthly**, **Weekly**, or **Daily**.
- **Day**: The choices for day depends on the choice made for Gen Start:

  If you chose a GenStart of Never: The Day is not configurable

  If you chose a GenStart of Monthly: Choose to perform the test on the **1st**, **2nd**, **3rd**, or **4th** week of the month on a specific day of the week.

  If you chose a GenStart of Weekly: Choose to perform the test on any day of the week.

  If you chose a GenStart of Daily: Choose to perform the test **Everyday**, on **Weekdays** (Monday through Friday), or on **Weekends** (Saturday and Sunday).
- **Time**: Set the time of day that the test will run. The time is set on a 24-hour clock.
- **Load Test**: Choose to test the generator with the data center load applied. Choose to perform the load test **By Month**, **Monthly**, **Never**, or **All**.

Next Test Lists the date and time of the next test.

Test Duration

The following items are available on this menu:

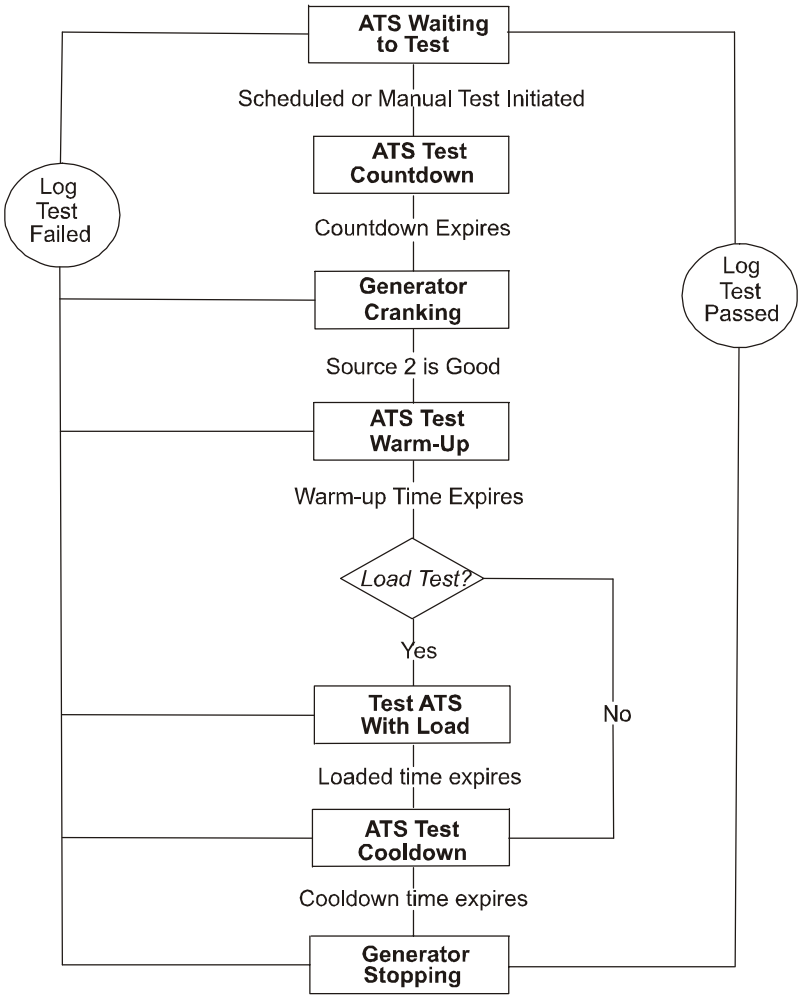
Warm Up Set the amount of time in seconds (up to 999) that the Generator will warm up during a test.

Loaded If the option to **Load Test** is selected, set the amount of time in minutes (up to 999) that the Generator will run with the data center load applied.

Cooldown Set the amount of time in seconds (up to 999) that the Generator will cool down after the test.

How a test occurs

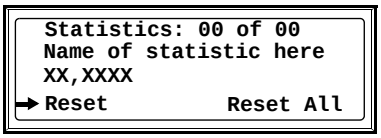
When a test is not in progress, the ATS is waiting for a test to occur. You initiate a test by scheduling a test on the **Test Schedule** screen on the display interface, or by starting a test immediately through the **Run/View Test** screen on the display interface. Once a test is initiated, the ATS will start counting down until the next test (**Next Test** item on the **Test Schedule** menu). Once the **Next Test** time expires, the ATS will signal the generator to start. The generator will crank in an attempt to start. If the generator does not start, the test fails and the ATS will log that the test failed. If the generator starts, and the ATS determines that Source 2 is OK, the test will begin with the configurable **Warm Up** time. Once the **Warm Up** time expires, the ATS will determine whether or not you want to perform a **System Load Test**, which is a test that the generator will run with the data center load applied to it.



If the test does not include a **System Load Test**, the ATS will proceed to the cooldown test stage. If the test includes a **System Load Test**, the ATS will transfer to Source 2. The transfer can be open or closed, depending on how the **Allow Closed** setting is configured on the **ATS Setup** menu. The load test will occur for the length of the **Loaded** time, and once the loaded time expires, the ATS will retransfer to Source 1 and then proceed to the cooldown test stage.

During the cooldown test stage, the generator will run for the duration of the configurable **Cooldown** time. Once the **Cooldown** time expires, the generator will stop and the ATS will log either that the test was successful or that it failed. The ATS displays test results on the **View Test Log** menu on the **Testing** screen.

Stats



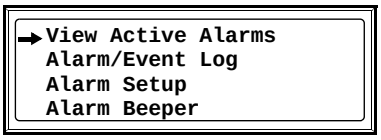
Scroll through a list of items that accumulate after the statistics record is reset, including:

- **Open Xfer Count**: The number of open transfers since this statistic was reset.
- **Closed Xfer Count**: The number of closed transfers since this statistic was reset.
- **Generator Fuel Used**: The amount of fuel used since this statistic was reset.
- **Source 1 Bad Count**: The number of times that Source 1 was not acceptable (as defined in the **Transfer Points** menu) since this statistic was reset.
- **S1 Low Volts Count**: The number of times that the Source 1 input voltage went below the configured **Low** voltage **Transfer Point** on one or more of the phases since this statistic was reset.
- **S1 High Volts Count**: The number of times that the Source 1 input voltage exceeded the configured **High** voltage **Transfer Point** on one or more of the phases since this statistic was reset.
- **S1 Bad Freq Count**: The number of times that the Source 1 input voltage went outside the configured **Freq** range (as defined in the **Transfer Points** menu) since this statistic was reset.
- **S1 Imbalance Count**: The number of times that the percent voltage difference between two phases, as defined by the **Phase Balance** setting in the **Transfer Points** menu, has been exceeded on Source 1 since this statistic was reset.
- **Total Time S1 Bad**: The total amount of time that Source 1 was not acceptable (as defined in the **Transfer Points** menu) since this statistic was reset.
- **Maximum Time S1 Bad**: The longest amount of time that Source 1 was not acceptable (as defined in the **Transfer Points** menu) since this statistic was reset.
- **Minimum Time S1 Bad**: The shortest amount of time that Source 1 was not acceptable (as defined in the **Transfer Points** menu) since this statistic was reset.
- **Time on Source 1**: The total amount of time that Source 1 was selected since this statistic was reset.
- **Time on Source 2**: The total amount of time that Source 2 was selected since this statistic was reset.

Reset — Reset only the statistic that is shown on the screen by pressing the ENTER key and following the prompts.

Reset All — Reset all of the statistics by pressing the ENTER key and following the prompts.

Alarms



View Active Alarms

View a list of all alarms that exist presently. When an alarm is present, the ATS display interface Alarm LED is red. Choosing this option to **View Active Alarms** turns the LED off.

Alarm/Event Log

The following items are available on this menu:

New Logged Items	View only alarms and events logged since **New Logged Items** was last viewed. When a new alarm is present, the ATS display interface Check Log LED is orange. Choosing this option, **New Logged Items**, turns the LED off.
Entire Log	View every item in the alarm/event log. When a new alarm is added to the log, the ATS display interface Check Log LED is orange. Choosing this option, **Entire Log**, turns the LED off.
Clear Log	Erase all of the items currently in the alarm/event log.
Clr Latched Alarms	Erase the latched alarms currently in the alarm/event log. See “Clearing latched alarms” on page 44 for more information.

Alarm Setup

Configure the alarm limits (or thresholds) on this menu:

Loading Limits	Iout-Alarm Limits: • **Low**: If the output current of any phase falls below this value, an alarm condition exists. The value is set as a percentage of the ATS rating, and also shown in amps. • **High**: If the output current of any phase exceeds this value, an alarm condition exists. The value is set as a percentage of the ATS rating, and also shown in amps. • **Neut**: If the output neutral current exceeds this value, an alarm condition exists. The value is set as a percentage of the ATS rating, and also shown in amps.
Voltage Limits	Vout-Alarm Limits: • **Low**: If the output voltage of any phase falls below this value, an alarm condition exists. The value is set as a percentage of the nominal system voltage, and also shown in volts. • **High**: If the output voltage of any phase exceeds this value, an alarm condition exists. The value is set as a percentage of the nominal system voltage, and also shown in volts.

Fuel Alarm Limits

Low Fuel Alarms:

- **Percent Fill**: If the amount of fuel as a percentage falls below this value, an alarm condition exists. See “Fuel monitoring/runtime calculation” on page 9 for more information.
- **Runtime**: If the estimated runtime falls below this value, an alarm condition exists. See “Fuel monitoring/runtime calculation” on page 9 for more information.

Other Limits

Other Limits:

- **Frequency**: If the frequency is outside this range, an alarm condition exists.
- **Alarm Delay**: Before an output alarm condition exists, a limit must be exceeded for this amount of time (in seconds). The advantage of the delay is that it filters short alarm conditions, which are normal in ATS operation. For example, when utility mains power is shut off, the ATS will have a low voltage condition; however, once the generator begins operation, this alarm is meaningless. An **Alarm Delay** of more than 15 seconds may prevent the display of the low voltage alarm in this example. The **Alarm Delay** applies to all Voltage, Loading, Frequency, and Runtime limits.

Alarm Beeper

When the alarm beeper is sounding, it will do so every 30 seconds, and touching any key on the ATS display interface will de-activate it. Use this menu option to turn the beeper off so that it never sounds when an alarm occurs, or turn the beeper on again. The default is On.

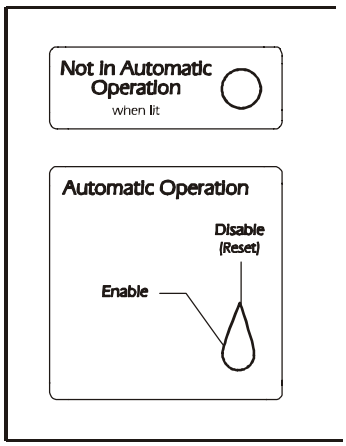
Clearing latched alarms

When an alarm is present, the ATS display interface Alarm LED is red. To clear latched alarms, you must acknowledge them differently than all other alarms. The following are latched alarms:

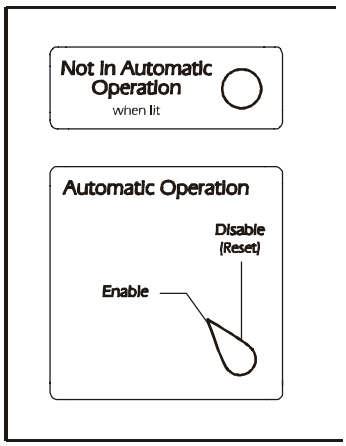
- **Test Complete-Failed**: The system has failed a self-test.
- **Gen Start Failure**: The generator failed to start.

To clear a latched alarm, choose the **Clr Latched Alarms** option on the **Alarm/Event Log** menu of the **Alarms** screen to turn the LED off. You can also clear latched alarms by resetting automatic operation on the ATS. To reset automatic operation on the ATS, set the Automatic Operation switch to **Disable** (❶) and then back to **Enable** (❷).

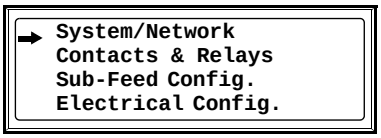
❶

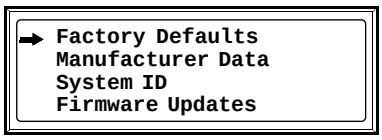


❷



Config





System/Network

The following items are available on this menu:

System Password

- **Password**: Change the system password required to access protected screens and fields in the display interface. Enter a string of up to eight alphanumeric characters, followed by the underline character (_) to indicate the end of the string. The default password is **apc**.
- **Timeout**: Set the time that the display interface waits for user input before it reverts to the initial scrolling of status screens. Select 1, 2, 5, 10 (the default) or 30 minutes; or 1, 2, or 4 hours, or forever.
- **Invalidate NOW**: Re-enter the system password for viewing password-protected screens.

Date/Time

- **Date**: Set in the following format: dd-mmm yyyy.
- **Time**: Set in the following format: hh:mm:ss

Local Interface

- **Contrast**: Set the screen contrast for the LCD. Select from **1** (high contrast) to **8** (low contrast).
- **Key Click**: Choose **On** for an audible click whenever you press a navigation key. Choose **Off** to disable the key click.
- **Beeper Volume**: Select **High**, **Medium**, **Low**, or **Off** to adjust the loudness of the audible beeper and the key click.
- **Metric Units**: Choose **On** to view all data as metric values (e.g., meters) and **Off** to view data as U.S. standard units (e.g., feet).

Network Config

- **IP**: The system IP address.
- **SM**: The subnet mask, which identifies the subnetwork on which the ATS operates.
- **GW**: The default gateway that the ATS uses.
  The MAC address is displayed at the bottom of the screen in brackets.

Contacts & Relays

The ATS can monitor external contact closure events. Possible applications include the following:

- Magnetic contact switches
- Window foil
- Tamper switches
- Heat detectors
- Water sensors
- Pressure sensors
- Building smoke and fire detection systems

You can set input contacts to cause alarm conditions based on their current state and a user-defined normal state. Relay outputs can map internal alarms and events to outside devices. Use the **Contacts & Relays** screen to display and configure information about input contacts and relay outputs.

Input Contacts

Scroll through the list to display information about each of the installed contact inputs. For example, **02of04** displays information about the second of four installed input contacts.

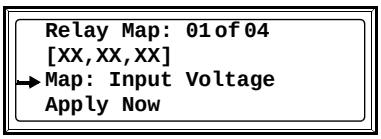
- **Name**: The name of this input contact (Maximum: 14 alphanumeric characters).
- **Normal**: The normal position of this input contact, either **Open** or **Closed**.
- **Status**: The position of this input contact. If the position is not the normal position, an alarm condition occurs.

Relay Outputs

Scroll through the list to display information about each of the installed relay outputs. For example, **04of04** displays information about the fourth of the four available relay outputs.

- **Name**: The name of this relay output (Maximum: 14 alphanumeric characters).
- **Normal**: The normal position of this relay output, either **Open** or **Closed**.
- **Status**: The position of this relay output.

Output Relay Map



Configure the relay outputs, using the **Output Relay Map**. Each **Relay Map** corresponds to a relay output. For example, **Relay Map 01of04** corresponds to the first of four relay outputs. The second line, in brackets [ ], lists the items that you have selected to map to the selected relay. The third line allows you to select the alarms to which you want to map the relay:

A!	Any Alarm
V1	Source 1 Quality Bad†
V2	Source 2 Quality Bad†
Vo	Output Voltage Alarm†
R	Run/Start Contact ON
S2	Source 2 Selected
F	Fuel/Runtime Alarm
L	Any Load Alarm
Au	ATS Not-in-Auto Mode
S!	The Source 1 and Source 2 switches are ON (closed)
C1	Contact 1‡
C2	Contact 2‡
C3	Contact 3‡
C4	Contact 4‡

† If you map all three of the voltage alarms (V1, V2, Vo), the map will display the following: V12o

‡ If you map all four of the contact alarms (C1,C2,C3,C4), the map will display the following: C1234

Electrical Config

The following items are available on this menu:

Voltage	Input voltage rating for the ATS.
Switch Rating	The amperage rating of the ATS.
Frequency	The frequency rating of the ATS.
DC Backup	Whether the ATS monitoring unit is receiving back-up power from the generator battery.

Factory Defaults

Use this option of the Config screen to reset all ATS settings to their factory default values.

Manufacturer Data

Use this option of the Config screen to display a scrollable list containing information about the ATS. This information is useful when requesting service or product updates. The following information is displayed:

- Manufacturer Name
- Date of Manufacture
- Date of Calibration
- Hardware Revision
- Firmware Revision
- Serial Number
- Model Number

System ID

The following items are available on this menu:

System Name	Set a unique name for your InfraStruXure Power Generation System.
Location	Name the physical location of the system in relation to your data center.
Contact	Identify the person to notify concerning questions or problems with regard to the system.

Communication Configuration

ATS Management Options

Overview

You have two management options for the ATS. You can manage the ATS along with the rest of your InfraStruXure equipment through the InfraStruXure Manager (APC LAN), or you can manage your ATS through APC's network management interfaces (User LAN).

InfraStruXure Manager

The InfraStruXure Manager is a rack-mount management device that coordinates the management functions of APC InfraStruXure-Certified devices installed in your data center. It provides one single interface to view and configure all APC InfraStruXure-Certified devices. See "Configuring the InfraStruXure Manager" on page 50 for configuration instructions.

See also

For more information about the InfraStruXure Manager, see the *Installation and Configuration* manual included with the InfraStruXure Manager.

Network management interfaces

The control console and Web interfaces provide menus with options that allow you to manage the ATS. See "Configuring the ATS Network Management Interface" on page 51 for configuration instructions.

See also

For more information about the internal user interfaces, see the InfraStruXure Power Generation System online *Network Management User's Guide*.

The SNMP interface allows you to use an SNMP browser with the PowerNet® Management Information Base (MIB) to manage the ATS. See "Configuring the ATS Network Management Interface" on page 51 for configuration instructions.

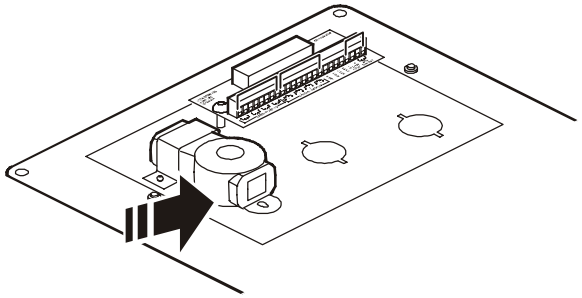
See also

To use the PowerNet MIB with an SNMP browser, see the *PowerNet® SNMP Management Information Base (MIB) Reference Guide*, which is provided on the InfraStruXure Power Generation System Utility CD.

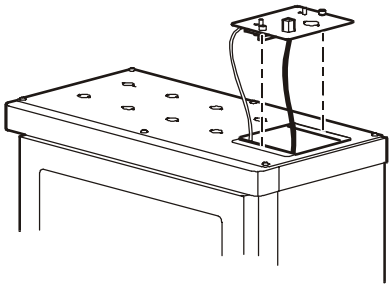
Configuring the InfraStruXure Manager

Connect the ATS to the InfraStruXure Manager

1. Connect a Cat-5 network cable to the surge-protected ethernet port on the ATS user connection plate. The arrow in the illustration below is pointing to the port. The figure on page 11 shows the location of the user connection plate on the roof of the ATS.



You can make connections from inside the enclosure, or you can remove the user connection plate and make your connections. Remove the plate using a Phillips or standard screwdriver to loosen the two captive screws. Use the knockout in the plate to route cables to and from the user connections on the plate. If you remove the plate, make sure that you do not disturb the existing connections.



2. Run the connected Cat-5 network cable through knockout in the user connection plate to the InfraStruXure Manager Hub.
3. Configure the InfraStruXure Manager once all APC InfraStruXure-Certified equipment is installed, the network cables are connected to the InfraStruXure Manager Hub, and start-up of the system is complete.

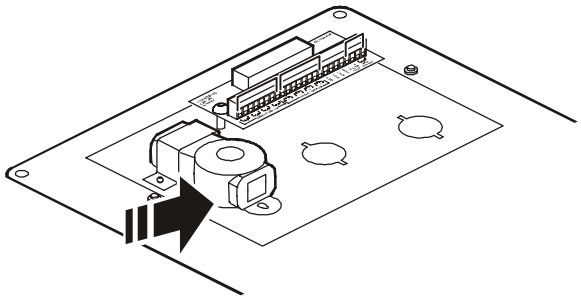
See also

For detailed configuration instructions, see the InfraStruXure Manager *Installation and Quick-Start* manual included with your InfraStruXure Manager.

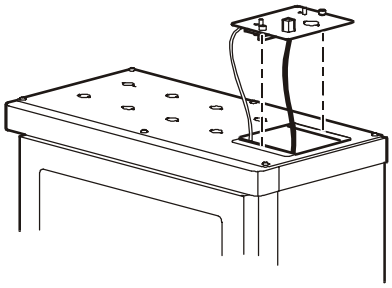
Configuring the ATS Network Management Interface

Connect the ATS to your network

1. Connect a Cat-5 network cable to the surge-protected ethernet port on the ATS user connection plate. The arrow in the illustration below is pointing to the port. The figure on page 11 shows the location of the user connection plate on the roof of the ATS.



You can make connections from inside the enclosure, or you can remove the user connection plate and make your connections. Remove the plate using a Phillips or standard screw driver to loosen the two captive screws. Use the knockout in the plate to route cables to and from the user connections on the plate. If you remove the plate, make sure that you do not disturb the existing connections.



2. Run the connected Cat-5 network cable through knockout in the user connection plate to your network connection.
3. Configure the TCP/IP settings of the ATS. See “Configuration Overview” on page 52 for further instructions.

Configuration Overview

You must configure the following TCP/IP settings before the ATS can operate on a network:

- IP address of the ATS (only needed for manual address assignment)
- Subnet mask
- Default gateway

If a default gateway is unavailable, use the IP address of a computer that is located on the same subnet as the ATS and that is usually running. The ATS uses the default gateway to test the network when traffic is very light. See “Watchdog Features” in the “Introduction” of the InfraStruXure Power Generation System’s On-line *Network Management User’s Guide* for more information about the watchdog role of the default gateway.

TCP/IP configuration methods

Use one of the following methods to define the TCP/IP settings needed by the ATS:

- Device IP Configuration Wizard (See “Device IP Configuration Wizard” on this page.)
- BOOTP or DHCP server (See “BOOTP & DHCP configuration” on page 53.)
- Local computer (See “Local access to the control console” on page 55.)
- Networked computer (See “Remote access to the control console” on page 55.)

Device IP Configuration Wizard

You can use the Device IP Configuration Wizard on a Windows NT®, Windows 2000, or Windows XP computer to discover unconfigured ATS systems and configure their basic TCP/IP settings.

To configure one or more ATSs by exporting configuration settings from a configured ATS, see “How to Export Configuration Settings” in the online *Network Management User’s Guide* on the Utility CD.

1. Insert the InfraStruXure Power Generation System Utility CD into a computer on your network.
2. Launch the Wizard, when prompted, or, if prompted to restart the computer, access the Wizard from the **Start** menu after the computer has restarted.
3. Wait for the Wizard to discover the first unconfigured ATS, then follow the on-screen instructions.

If you leave the **Start a Web browser when finished** option enabled, you can use **apc** for both the **User Name** and **Password** to access the ATS through your browser.

BOOTP & DHCP configuration

The **Boot Mode** Setting, a TCP/IP option in the ATS's **Network** menu, identifies how the TCP/IP settings will be defined. The possible settings are **Manual**, **DHCP only**, **BOOTP only**, and **DHCP & BOOTP** (the default setting).

The **DHCP & BOOTP** setting assumes that a properly configured DHCP or BOOTP server is available to provide TCP/IP settings to ATSs. If these servers are unavailable, see "Device IP Configuration Wizard" on page 52, "Local access to the control console" on page 55, or "Remote access to the control console" on page 55 to configure the needed TCP/IP settings.

With **Boot Mode** set to DHCP & BOOTP, the ATS attempts to discover a properly configured server. It first searches for a BOOTP server, then a DHCP server, and repeats this pattern until it discovers a BOOTP or DHCP server.

For more information, see "BOOTP" on page 53 or "DHCP" on page 54.

BOOTP. You can use an RFC951-compliant BOOTP server to configure the TCP/IP settings for the ATS.

The BOOTP setting assumes that a properly configured BOOTP server is available to provide TCP/IP settings to APC ATSs. If a BOOTP server is unavailable, see "Device IP Configuration Wizard" on page 52, "Local access to the control console" on page 55, or "Remote access to the control console" on page 55 to configure the TCP/IP settings.

1. Make sure that the **BOOTP** setting, a **TCP/IP** option in the ATS's **Network** menu, is enabled.
2. Enter the ATS's MAC and IP addresses, the subnet mask and default gateway settings, and an optional Bootup file name in the BOOTPTAB file of the BOOTP server.

For the MAC address, look on the Quality Assurance slip included with the ATS.

3. When the ATS reboots, the BOOTP server provides it with the TCP/IP settings.
   - If you specified a bootup file name, the ATS attempts to transfer that file from the BOOTP server using TFTP or FTP. The ATS assumes all settings specified in the bootup file.
   - If you did not specify a bootup file name, the ATS can be configured remotely by using Telnet or by using the Web interface: **User Name** and **Password** are both **apc**, by default.

To create the bootup file, see your BOOTP server documentation.

DHCP. You can use a RFC2131/RFC2132-compliant DHCP server to configure the TCP/IP settings for the ATS.

See also

This section briefly summarizes the ATS communication with a DHCP server. For more detail about how a DHCP server is used to configure the network settings for a ATS, see "DHCP Configuration" in the InfraStruXure Power Generation System's online *Network Management User's Guide*.

1. An ATS sends out a DHCP request that uses the following to identify itself:
   - A Vendor Class Identifier (APC by default)
   - A Client Identifier (by default, the ATS's MAC address value)
   - A User Class Identifier (by default, the identification of the ATS's application firmware)
2. A properly configured DHCP server responds with a DHCP offer that includes all of the settings that the ATS needs for network communication. The DHCP offer also includes the **Vendor Specific Information** option (DHCP option 43). By default, the ATS will ignore DHCP offers that do not encapsulate the APC cookie in the Vendor Specific Information option using the following hexidecimal format:

   ```
   Option 43 = 01 04 31 41 50 43
   ```

   where
   - the first byte (`01`) is the code
   - the second byte (`04`) is the length
   - the remaining bytes (`31 41 50 43`) are the APC cookies

See your DHCP server documentation to add code to the Vendor Specific Information option. To disable the APC cookie requirement, see "Local access to the control console" on page 55.

To change the control console's **DHCP Cookie Is** setting, use the **Advanced** option in the TCP/IP menu. See "Remote access to the control console" on page 55.

Local access to the control console

You can use a local computer that connects to the ATS through the console port on the ATS monitoring unit to access the control console. If you are accessing the ATS on the local control console, you will not receive any information about the generator.

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Use the configuration cable (940-0103) to connect the selected port to the console port on the ATS monitoring unit.
3. Run a terminal program (such as HyperTerminal) on your computer and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control, and save the changes.
4. Press ENTER to display the **User Name** prompt.
5. Use **apc** for the **User Name** and **Password**.
6. See “Control console” on page 56 to finish the configuration.

Remote access to the control console

From any computer on the same subnet as the ATS, you can use ARP and Ping to assign an IP address to an ATS, and then use Telnet to access that ATS’s control console and configure the needed TCP/IP settings.

Note

After an ATS has its IP address configured, you can use Telnet, without first using ARP and Ping, to access that ATS.

1. Use ARP to define an IP address for the ATS, and use the ATS’s MAC address in the ARP command. For example, to define an IP address of 156.205.14.141 for an ATS that has a MAC address of 00 c0 b7 63 9f 67, use one of the following commands:
   - Windows command format:
     ```
     arp -s 156.205.14.141 00-c0-b7-63-9f-67
     ```
   - LINUX command format:
     ```
     arp -s 156.205.14.141 00:c0:b7:63:9f:67
     ```

     See also

     For the MAC address, look on the Quality Assurance slip included with the ATS.
2. Use Ping with a size of 113 bytes to assign the IP address defined by the ARP command. For the IP address defined in step 1, use one of the following Ping commands:
   - Windows command format:
     ```
     ping 156.205.14.141 -l 113
     ```

– LINUX command format:

```
ping 156.205.14.141 -s 113
```

3. Use Telnet to access the ATS at its newly assigned IP address. For example:

```
telnet 156.205.14.141
```

4. Use **apc** for both **User Name** and **Password**.
5. See “Control console” on this page to finish the configuration.

Control console

After you log on at the control console, as described in “Local access to the control console” on page 55 or “Remote access to the control console” on page 55:

1. Choose **Network** from the **Control Console** menu.
2. Choose **TCP/IP** from the **Network** menu.
3. If you are not using a **BOOTP** or **DHCP** server to configure the **TCP/IP** settings, select the **Boot Mode** menu. Select **Manual boot mode**, and then press ESC to return to the **TCP/IP** menu. (Changes will take effect when you log out.)
4. Set the **System IP**, **Subnet Mask,** and **Default Gateway** address values.
5. Press CTRL-C to exit to the **Control Console** menu.
6. Log out (option 4 in the **Control Console** menu).

Note

If you disconnected a cable during the procedure described in “Local access to the control console” on page 55, reconnect that cable and restart the associated service.

How to Access the ATS Network Management Interface

The procedures in this section apply if you want to access the ATS from the public LAN, if you want to access the ATS through the APC LAN, see the InfraStruXure Manager's Installation and Quick-Start manual for information.

Web interface

As your browser, you can use Microsoft® Internet Explorer 5.0 (and higher) or Netscape® 4.0.8 (and higher, except Netscape 6.*x*) to access the ATS through its Web interface. Other commonly available browsers also may work but have not been fully tested by APC.

To use the Web browser to configure ATS options or to view the event log, you can use either of the following:

- The HTTP protocol (enabled by default), which provides authentication by user name and password but no encryption.
- The more secure HTTPS protocol, which provides extra security through Secure Socket Layer (SSL) and encrypts user names, passwords, and data being transmitted. It also provides authentication of Network Management Cards by means of digital certificates.

To access the Web interface and configure the security of your device on the network:

1. Address the ATS by its IP address or DNS name (if configured).
2. Enter the user name and password (by default, **apc** and **apc** for an Administrator, or **device** and **apc** for a Device Manager).
3. Select and configure the type of security you want. (This option is available only for Administrators.)

See the chapter entitled "Security" in the InfraStruXure Power Generation System's online *Network Management User's Guide* for information on choosing and setting up your network security. Use the **Web/SSL** option of the **Network** menu to enable or disable the HTTP or HTTPS protocols.

Telnet and SSH

You can access the control console through Telnet or Secure SHell (SSH), depending on which is enabled. (An Administrator can enable these access methods through the **Telnet/SSH** option of the **Network** menu.) By default, Telnet is enabled. Enabling SSH automatically disables Telnet.

Telnet for basic access. Telnet provides the basic security of authentication by user name and password, but not the high-security benefits of encryption. To use Telnet to access an ATS's control console from any computer on the same subnet:

1. At a command prompt, use the following command line, and press ENTER:

   `telnet` ***`address`***

   As ***`address`***, use the ATS's IP address or DNS name (if configured).

2. Enter the user name and password (by default, **apc** and **apc** for an Administrator, or **device** and **apc** for a Device Manager).

SSH for high-security access. If you use the high security of SSL for the Web interface, use Secure SHell (SSH) for access to the control console. SSH encrypts user names, passwords, and transmitted data.

The interface, user accounts, and user access rights are the same whether you access the control console through SSH or Telnet, but to use SSH, you must first configure SSH and have an SSH client program installed on your computer.

See also

See the InfraStruXure Power Generation System's On-line *Network Management User's Guide* for more information on configuring and using SSH.

SNMP

After you add the PowerNet MIB to a standard SNMP MIB browser, you can use that browser for SNMP access to the ATS. The default read community name is **public**; the default read/write community name is **private**.

Note

If you enable SSL and SSH for their high-security authentication and encryption, disable SNMP. Allowing SNMP access to the ATS compromises the high security you implement by choosing SSL and SSH. To disable SNMP, you must be an Administrator; use the **SNMP** option of the **Network** menu.

FTP and SCP

You can use FTP (enabled by default) or Secure CoPy (SCP) to transfer new firmware to the ATS, or to access a copy of the ATS's event logs. SCP provides the higher security of encrypted data transmission and is enabled automatically when you enable SSH.

Note

If you enable SSL and SSH for their high-security authentication and encryption, disable FTP. Allowing file transfer to the ATS through FTP compromises the high security you implement by choosing SSL and SSH. To disable FTP, you must be an Administrator; use the **FTP Server** option of the **Network** menu.

To access the ATS through FTP or SCP, the default user name and password are **apc** and **apc** for an Administrator, or **device** and **apc** for a Device Manager. In the command line, use the IP address of the unit.

See also

See the InfraStruXure Power Generation System's online *Network Management User's Guide* to use FTP or SCP to retrieve log files from the ATS or to transfer firmware files to the ATS.

How to Recover From a Lost Network Management Interface Password

Note

Disregard the procedures in this section if you have the APC InfraStruXure Manager as part of your system. See the InfraStruXure Manager's Installation and Quick-Start manual for information on recovering from a lost password.

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Connect the serial cable (940-0103) to the selected port on the computer and to the console port on the ATS monitoring unit.
3. Run a terminal program (such as HyperTerminal®) on your computer and configure the selected port as follows:
   - 9600 bps
   - 8 data bits
   - no parity
   - 1 stop bit
   - no flow control
4. Press ENTER, repeatedly if necessary, to display the **User Name** prompt. If you are unable to display the **User Name** prompt, verify the following:
   - The serial port is not in use by another application.
   - The terminal settings are correct as specified in step 3.
   - The correct cable is being used as specified in step 2.
5. Press the **Reset** button on the ATS monitoring unit. The Status LED will flash alternately orange and green. Press the **Reset** button on the ATS monitoring unit a second time immediately while the LED is flashing to reset the user name and password to their defaults temporarily.
6. Press ENTER as many times as necessary to re-display the **User Name** prompt, then use the default, **apc,** for the user name and password. (If you take longer than 30 seconds to log on after the **User Name** prompt is re-displayed, you must repeat step 5 and log on again.)
7. From the **Control Console** menu, select **System**, then **User Manager**.
8. Select **Administrator**, and change the **User Name** and **Password** settings, both of which are now defined as **apc**.
9. Press CTRL-C, log off, reconnect any serial cable you disconnected, and restart any service you disabled.

Customizing and Updating the ATS

How to Connect User Input Contacts and Relay Outputs to the ATS

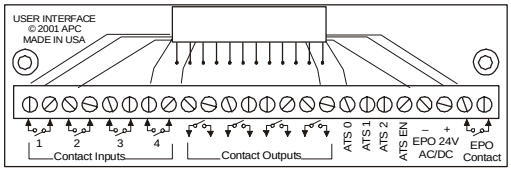
Overview

The ATS can monitor external contact closure events. Possible applications include the following:

- Magnetic contact switches
- Window foil
- Tamper switches
- Heat detectors
- Water sensors
- Pressure sensors
- Building smoke and fire detection systems

You can set input contacts to cause alarm conditions based on their current state and a user-defined normal state. Relay outputs can map internal alarms and events to outside devices. See “Contacts & Relays” on page 46 for information on setting up alarms.

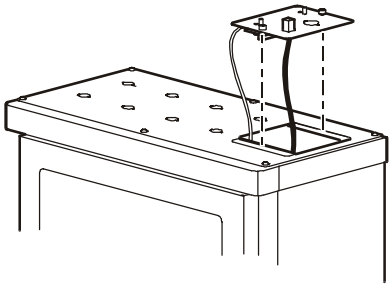
Make contact closure connections (NO or NC) at the user interface circuit board on the user connection plate. (See figure at right.) You can make eight connections—four input contacts and four relay outputs. The user connection plate is on the roof of the ATS enclosure. For more information on the user connection plate see “User connection plate” on page 16.



Note

The terminal block on the user connection plate accepts wire sizes from 12 to 30 AWG or 2.5 to 0.2 mm^2.

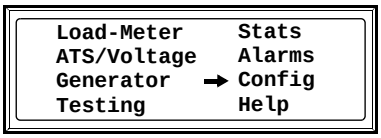
You can make connections from inside the enclosure, or you can remove the user connection plate and make your connections. Remove the plate using a Phillips or standard screw driver to loosen the two captive screws. Use the knockout in the plate to route cables to and from the user connections on the plate. If you remove the plate, make sure that you do not disturb the existing connections.



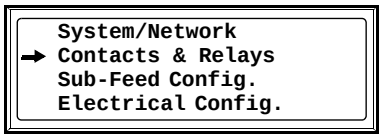
How to connect contacts to the ATS user connection plate

To connect and monitor your contacts:

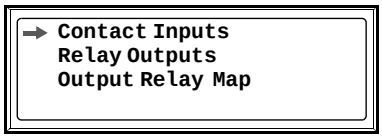
1. Choose one or more contact numbers on the user connection plate to which you will connect the contacts. (The user connection plate is connected to the User/EPO port on the ATS monitoring unit.)
2. From the ATS display interface:
   a. Press the ESC or ENTER key to go to the top-level menu screen.
   b. Select **Config** on the top-level menu screen and press the ENTER key.



   c. Select **Contacts & Relays** on the Config menu screen and press the ENTER key.



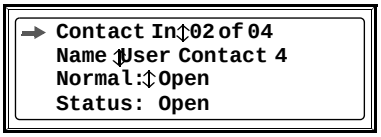
   d. Select the type of contact you are connecting: **Contact Inputs** or **Relay Outputs**.



Note

You will be prompted for your password to configure these items.

   e. Press the Up or Down arrow key to select the appropriate contact number and press the ENTER key.
   f. Press the Down arrow key to enter a unique **Name** for the contact and to configure the **Normal** state of the contact (**Open** or **Closed**). The default **Normal** state is **Open**. Press the ENTER key to select the item you wish to configure.



   g. Connect contact wires (300V-rated cabling required) to the terminal block on the user connection plate. You will need a 2.5-mm standard screwdriver.
   h. Run the wires from the terminal block out the roof of the ATS to your contact's location.

Caution

Ensure that the wires are properly retained and away from high voltage wires and breakers.

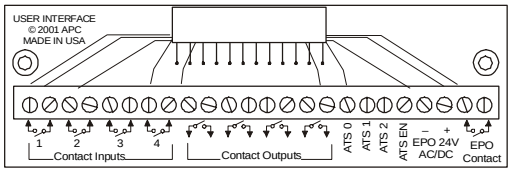
How to Connect an EPO Switch to the ATS

Note

If you do not connect an EPO switch to the ATS, make sure to set the ATS **Arm/Test** rocker on the ATS monitoring unit to **Test**.

Overview

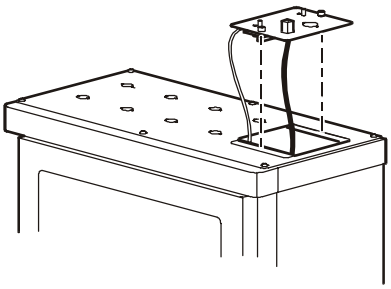
Connecting the switch. The Emergency Power Off (EPO) switch connects to the ATS user connection plate. The figure on page 11 shows the location of the user connection plate on the roof of the ATS. Connect a switch to the user interface circuit board (shown at right) using one of three following connections:



- Contact closure (**Recommended!**)
- 24VAC
- 24VDC

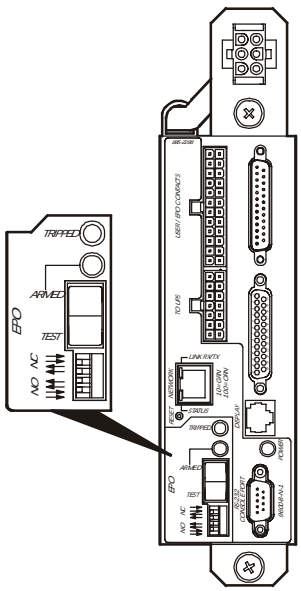
Note

The terminal block on the user connection plate accepts wire sizes from 12 to 30 AWG or 2.5 to 0.2 mm^2.



You can make connections from inside the enclosure, or you can remove the user connection plate and make your connections. Remove the plate using a Phillips or standard screw driver to loosen the two captive screws. Use the knockout in the plate to route cables to and from the user connections on the plate. If you remove the plate, make sure that you do not disturb the existing connections.

Configuring and testing. Configuring and testing of the switch is done through the EPO interface on the ATS monitoring unit. The figure to the right shows the ATS monitoring unit and the location of the EPO LEDs and DIP switches.



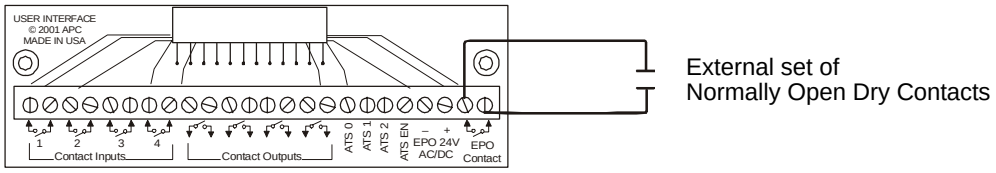
Note

APC offers an optional InfraStruXure EPO System (EPW9). Contact your APC sales representative, or visit the APC Web site **(www.apc.com)** for more information.

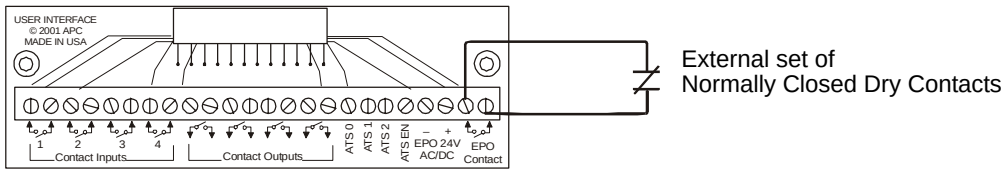
Connect an EPO switch to the user connection plate and test the switch

1. Connect the switch to the EPO connection point terminals located on the bottom side of the ATS user connection plate. Read the label next to the terminal block to determine which terminals to connect to for the signal type you are using:

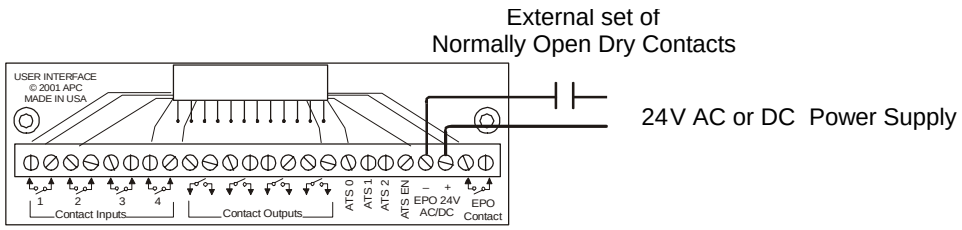
   – **Contact Closure—Normally Open**



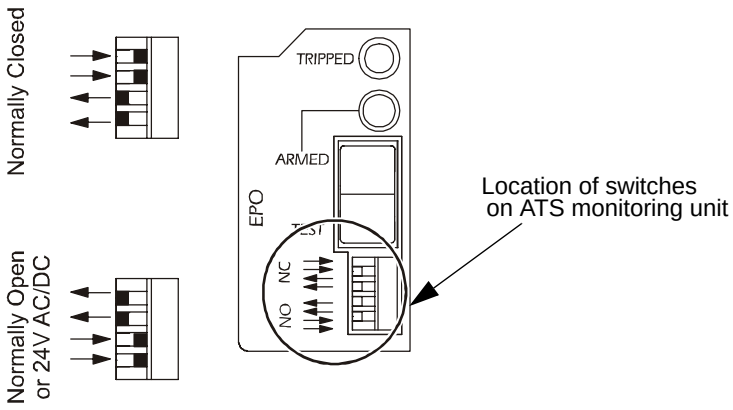
   – **Contact Closure—Normally Closed**



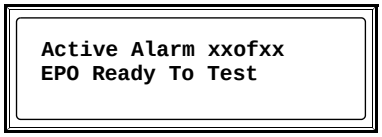
   – **24VAC/VDC—Normally Open**



2. Verify that the EPO DIP switches on the ATS monitoring unit are configured properly for the signal type you are using. The labels above the switches and the figure below show the correct settings for both the Normally Open (NO) and Normally Closed (NC) position.



3. Test the EPO switch to ensure that it is wired and working correctly:
   a. Place the **Arm/Test** rocker switch on the ATS monitoring unit in the **Test** position. The EPO state LEDs will be off and the ATS display interface will show the following alarm (in addition to any other active alarms):



   b. Engage the EPO switch. (If your switch is momentary, engage it with one person watching the EPO state LEDs, and another at the EPO switch.)
   c. Observe the EPO LEDs. If the switch is wired and working properly, when the switch is engaged, both of the EPO state LEDs are red.
   d. If the test was successful, place the **Arm/Tes**t rocker switch back to the **Arm** position. The ATS display interface will clear the EPO test mode alarm. If the test was not successful, see the troubleshooting chart:

Problem	**Action**
Neither state LED was red when EPO switch was engaged	• Check the wiring to your EPO switch. • Check to make sure the EPO DIP switch configuration is correct for your switch (NO or NC). See step 2 on the previous page for proper configuration instructions.
Only one of the state LEDs was red when EPO switch was engaged	• Check to make sure the EPO DIP switch configuration is correct for your switch (NO or NC) and test again. See step 2 on the previous page for proper configuration instructions. • If the switch is configured correctly and both LEDs are not red after testing again, contact customer support at a number on the back cover of this manual.

   e. Repeat this test for each EPO switch installed.
4. After testing is completed, ensure that the **Arm/Test** rocker switch is in the **Arm** position on the ATS monitoring unit.

Safety warnings

Hazardous voltage from the branch circuit must be isolated from the 24VAC, 24VDC, and contact closure terminals. 24VAC and 24VDC are considered Class 2 circuits as defined in Article 725 of the National Electrical Code (NFPA 70) and Section 16 of the Canadian Electrical Code (C22.1).

A Class 2 circuit is a source having limited voltage and energy capacity as follows:

a. If an Inherently Limited Power Source, voltage and energy are limited to less than 30VAC, less than 30VDC, and 8A.

b. If not an Inherently Limited Power Source, voltage and energy are limited to less than 30VAC, less than 60VDC, 250VA, and the current is limited to 1000/Vmax. The fuse is limited to 5A if less than 20VAC or 20VDC, or 100/Vmaximum if less than 30VAC or 60VDC.

If you choose to use a 24VAC, 24VDC, or contact closure connection to the EPO, use one of the following UL-listed wire types:

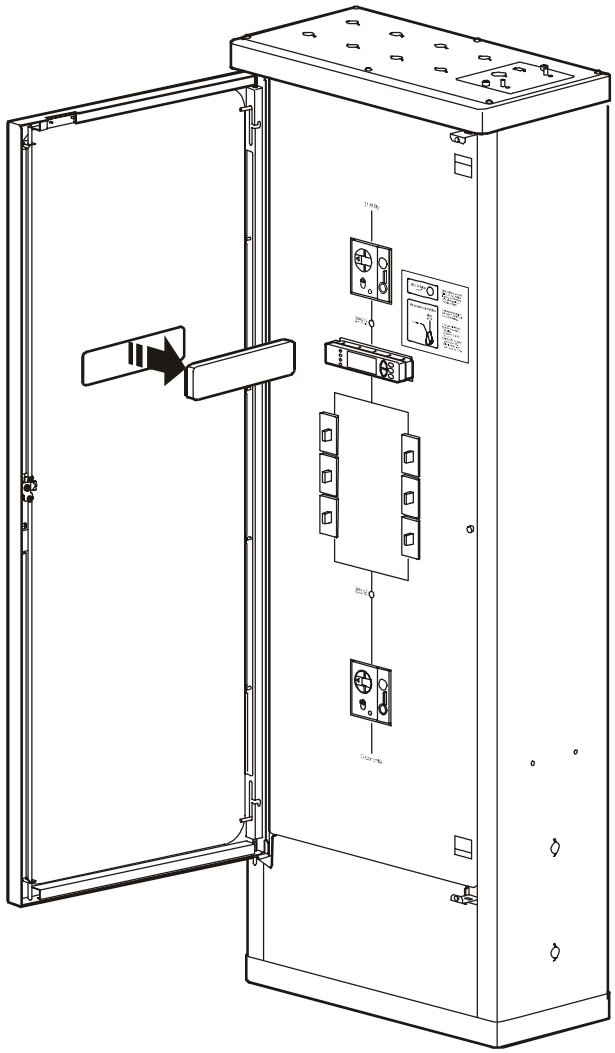
- CL2 Class 2 cable for general purpose use
- CL2P Plenum cable for use in ducts, plenums, and other space used for environmental air
- CL2R Riser cable for use in a vertical run shaft from floor to floor
- CL2X Limited Use cable for use in dwellings and for use in a raceway
- For installation in Canada, the cable should be CSA Certified, type ELC (extra-low-voltage control cable).

If you do not use a CL2 cable, route the EPO wiring in conduit that does not contain any branch circuit wiring.

How to Allow Easy Access to the ATS Display Interface

The front door of the ATS has a Plexiglas plate protecting access to the switches, circuit breakers, and the display interface. If you want to access the display interface without opening the front door, you can remove the rectangle of Plexiglas covering the display interface. The Plexiglas square is attached to the front door by strong adhesive.

To remove the rectangle, open the front door and press firmly on the square from the outside of the door, pressing toward the inside of the ATS. You may need to use a screwdriver or other flat tool to pry the square from the inside of the door.



How to Add Sub-Feed Output Distribution Circuit Breakers to the ATS

Output distribution circuit breakers available from APC

Part Number	Description	Width
PG1P15AT1B	15 A, single-pole breaker, T1 frame	1.00 in / 25.4 mm
PG1P20AT1B	20 A, single-pole breaker, T1 frame	1.00 in / 25.4 mm
PG1P25AT1B	25 A, single-pole breaker, T1 frame	1.00 in / 25.4 mm
PG1P30AT1B	30 A, single-pole breaker, T1 frame	1.00 in / 25.4 mm
PG3P20AT1B	20 A, three-pole breaker, T1 frame	3.00 in / 76.2 mm
PG3P25AT1B	25 A, three-pole breaker, T1 frame	3.00 in / 76.2 mm
PG3P30AT1B	30 A, three-pole breaker, T1 frame	3.00 in / 76.2 mm
PG3P40AT1B	40 A, three-pole breaker, T1 frame	3.00 in / 76.2 mm
PG3P50AT1B	50 A, three-pole breaker, T1 frame	3.00 in / 76.2 mm
PG3P60AT1B	60 A, three-pole breaker, T1 frame	3.00 in / 76.2 mm
PG3P70AT1B	70 A, three-pole breaker, T1 frame	3.00 in / 76.2 mm
PG3P80AT1B	80 A, three-pole breaker, T1 frame	3.00 in / 76.2 mm
PG3P90AT1B	90 A, three-pole breaker, T1 frame	3.00 in / 76.2 mm
PG3P100AT1B	100 A, three-pole breaker, T1 frame	3.00 in / 76.2 mm
PG3P125AT3B	125 A, three-pole breaker, T3 frame	4.13 in / 104.9 mm
PG3P150AT3B	150 A, three-pole breaker, T3 frame	4.13 in / 104.9 mm
PG3P175AT3B	175 A, three-pole breaker, T3 frame	4.13 in / 104.9 mm
PG3P200AT3B	200 A, three-pole breaker, T3 frame	4.13 in / 104.9 mm
PG3P225AT3B	225 A, three-pole breaker, T3 frame	4.13 in / 104.9 mm
PG3P300AT5B	300 A, three-pole breaker, T5 frame	5.49 in / 139.5 mm
PG3P400AT5B	400 A, three-pole breaker, T5 frame	5.49 in / 139.5 mm

Determine the configuration of the panel

Before you begin installing circuit breakers on the ATS distribution panel, be sure that you have enough space on the panel for the breakers that you want to install. Use the information in the diagrams below to determine the final configuration of the panel.

Amount of space required for each type of circuit breaker

ABB T1, single-pole breaker assembly

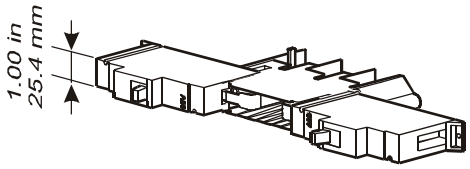


ABB T1, three-pole breaker assembly

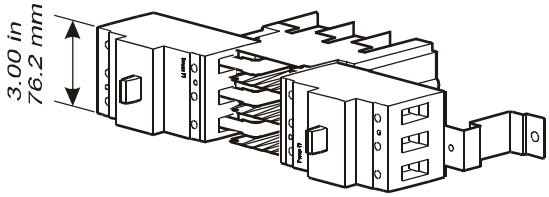
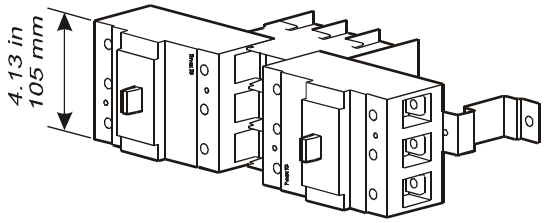
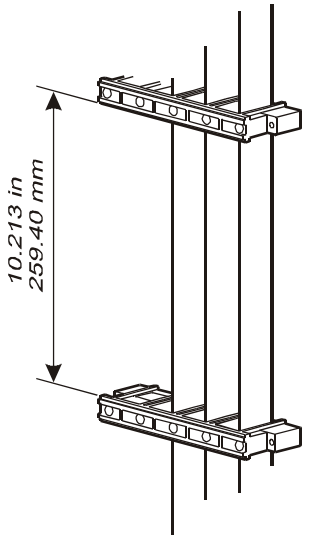


ABB T3, three-pole breaker assembly



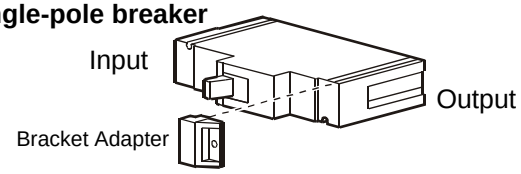
Amount of space available on the 250 A ATS Distribution Panel Bus



Preparing the breakers for installation

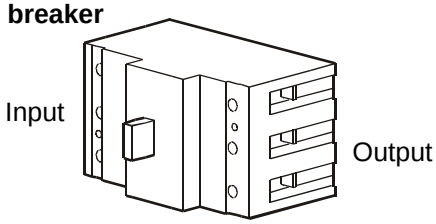
Before installing the breakers on the ATS panel board, follow the steps in this section for the breaker you are installing. The parts that are identified in the illustrations below are included with your circuit breaker kit.

ABB T1, single-pole breaker



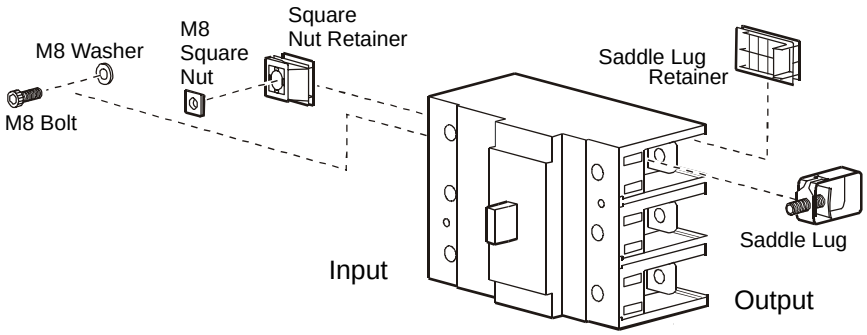
Slide the bracket adapter on the output side of the T1 single-pole breaker. The bracket adapter is used to attach the breaker to the breaker bracket.

ABB T1, three-pole breaker



The T1 three-pole breakers are ready for installation on the panel. No additional preparation is needed.

ABB T3, three-pole breaker



Both the input and output sides of the T3 three-pole breaker require preparation before the breaker is installed on the panel.

On the input side follow these steps for each of the three pole positions:

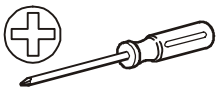
1. Place an M8 square nut into a square nut retainer, and insert the square nut retainer into the pole position.
2. Slide an M8 washer onto an M8 bolt, and insert the bolt into the pole position by loosely attaching the bolt to the M8 square nut installed in previous steps.

On the output side follow these steps for each of the three pole positions:

3. Slide a saddle lug into the pole position. You may need to loosen the bolt in the lug.
4. Insert a saddle lug retainer into the pole position.

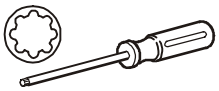
Parts and tools needed for installation procedures

Tools required



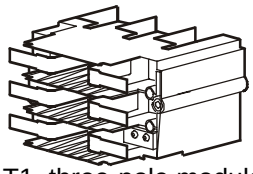
Phillips screwdriver

Allen wrench

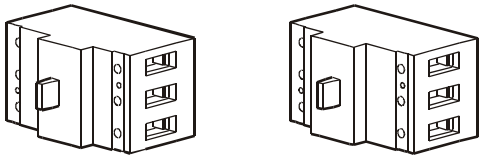


T25 Torx driver

T1, three-pole breaker assembly

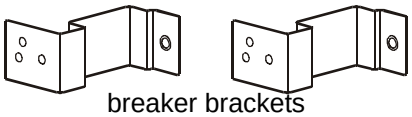


T1, three-pole module

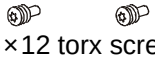


T1, three-pole breakers

M4×70 screws and washers



breaker brackets



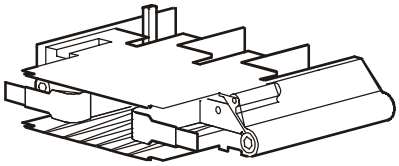
M6×12 torx screws

M4×70 screws and washers

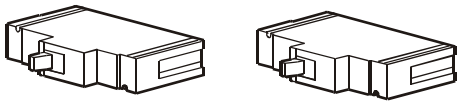
All parts needed for installation procedures are included with the circuit breaker kits.

Note

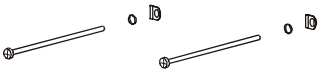
T1, single-pole breaker assembly



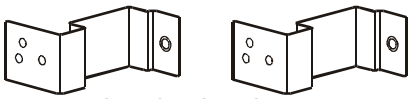
T1, single-pole module



T1, single-pole breakers

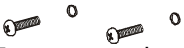


M3×75 screws, washers and retainers



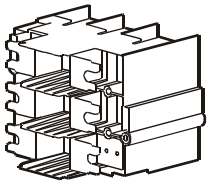
breaker brackets

M6×12 torx screws

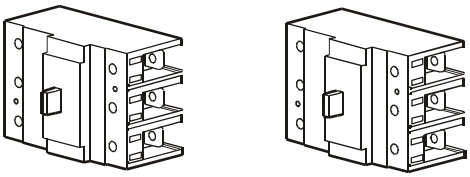


M4×15 screws and washers

T3, three-pole breaker assembly

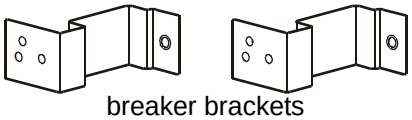


T3, three-pole module



T1, three-pole breakers

M4×70 screws and washers



breaker brackets

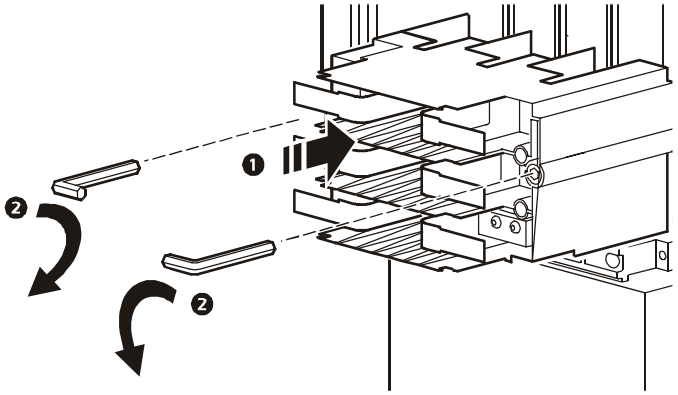
M6×12 torx screws

M4×70 screws and washers

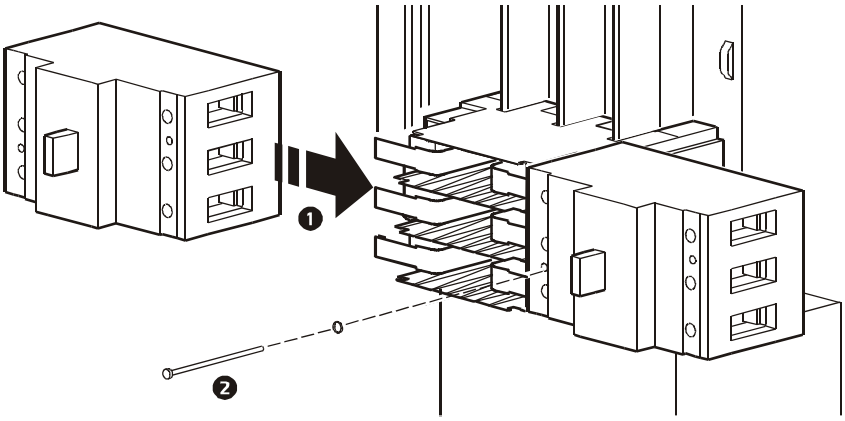
Installing breakers on the ATS panel board

This procedure shows the installation of the T1, three-pole breaker assembly on a 250A ATS panel board. The steps are identical for installing the T1 single-pole and T3 three-pole breakers.

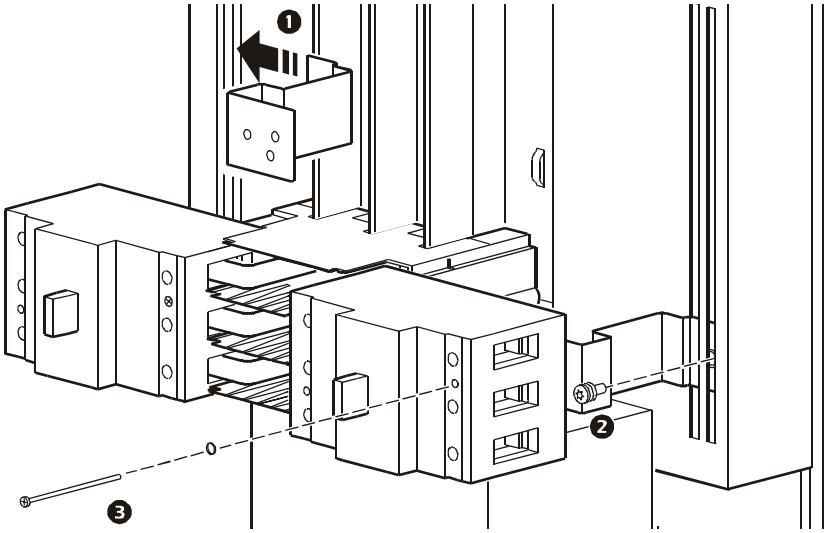
1. Attach the module to the ATS panel board (❶), and secure by turning the module locks using an allen wrench (❷).



2. Snap the breakers onto the module's bus bars (❶) and lock in place with an M4×70 screw (❷). Use a Phillips screwdriver to tighten.



3. Attach the breaker brackets to the slots in the distribution bus frame (❶), and secure using an M6×12 Torx screw (❷). Use a T25 Torx driver to tighten. Attach the breaker to the breaker bracket using an M4×70 screw (❸). Use a Phillips screwdriver to tighten.



How to Download Firmware Updates

The InfraStruXure ATS with Power Distribution requires multiple files to be downloaded to update the firmware. Be sure to select all relevant files from the APC website for download, and repeat this procedure for each of the firmware files.

See also

To download a firmware upgrade and transfer it to your ATS, see "File Transfers" in the InfraStruXure Power Generation System's online *Network Management Interface User's Guide* on the Utility CD.

From a local computer

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Use the configuration cable to connect the selected port to the console port on the ATS monitoring unit.
3. Run a terminal program (such as HyperTerminal) and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control. Save the changes.
4. Press ENTER twice to display the **User Name** prompt.
5. Enter your **User Name** and **Password** (**apc** is the default administrator user name and password) and press the ENTER key.
6. From the **Control Console** menu, select **System**, then **Tools**, then **File Transfer,** then **XMODEM**.
7. The system will prompt you with `Perform transfer with XMODEM -CRC?` Type `Yes` and press ENTER.
8. The system will then prompt you to choose a transfer rate and to change your terminal settings to match the transfer rate. Press ENTER to set the ATS to accept the download.
9. In the terminal program, send the file using the XMODEM protocol. Upon completion of the transfer, the console will prompt you to restore the baud rate to normal.

Caution

Do not interrupt the download.

The ATS network management interface will reboot when the download is complete.

Specifications

ATS with Power Distribution

Electrical

Current Rating	250 A
Voltage Class	480 VAC
Voltage Available	208/120 wye, 480 delta, 480 wye
Maximum Power	208 kW
Frequency	50/60 Hz Nominal, ±5 Hz
Interrupting Rating	35 kAIC
ATS Main Protection	Magnetic fixed
ATS Switched Poles	Three
EPO connection	Dry contact and 24 VDC
EPO operation	Disconnects all outputs
Output Distribution	MCCB ABB Tmax T1 and T3 up to 225 A
Output Poles	Three
Output Breaker Max Ampacity	225 A
Length of Breaker Bus Section	10.2 in / 260 mm
Number of 100 A Breaker Frames	Six T1 3-Pole‡
Number of 225 A Breaker Frames	Four T3 3-Pole‡
Output Distribution Protection Type	Thermal Magnetic

Physical

Dimensions	
Height	75.0 in / 1905 mm
Width	28.0 in / 711 mm
Depth	14.5 in / 368 mm
Weight	482 lb/218 kg
Shipping Dimensions	
Height	81.0 in / 2057 mm
Width	34.0 in / 864 mm
Depth	34.0 in / 864 mm
Maximum Shipping Weight	482 lb / 219 kg
Cooling	Natural convection
Enclosure	NEMA 1 with drip protection; Raven black
Access Control	Key-locked door and fastener-locked deadfront, user-removable cover for user keypad/display and password

Installation and Wiring	**208 V**	**480 V**
Maximum Utility Mains Input Over-current Protection Required	225 A UL-listed Breaker (50 kAIC)	
Utility Mains Input Connection Type	4W + G	3W + G or 4W+G
Size of upstream utility circuit breaker	250 A	200 A
Recommended wire size if 30°C†	4/0 AWG	3/0 AWG
Recommended wire size if 40°C†	300 kcmil	3/0 AWG
Recommended protective earth size†	2AWG	4AWG
Generator Input Connection Type	4W + G	3W + G or 4W+G
Output power of generator	80 kW	125 kW
Size of generator output breaker	250 A	200 A
Recommended wire size if 30°C†	4/0 AWG	3/0 AWG
Recommended wire size if 40°C†	300 kcmil	3/0 AWG
Recommended protective earth size†	2AWG	4AWG
Supply to Generator Heater and Charger	Hard-wire from transformer in ATS to double duplex NEMA 5-20 outlet box on generator	
Recommended wire size†	Two, 12AWG stranded copper	
Voltage	120VAC	
Installation type	Floorstanding secured to wall (concrete screws included)	
Input/Output Cabling	Top and bottom routing	
Rear Access Required	No	
NEC Access Clearances	• Three feet to an insulated surface • Three feet to grounded parts, including concrete walls, if 208/120V • Three and a half feet to grounded parts, including concrete walls, if 480/277V • Three feet to other live parts, if 208/120V • Four feet to other live parts, if 208/120V	

† Always follow the National Electric Code (NFPA 75) or the Canadian Electric Code (CSA C22.1-02) and local codes when installing the InfraStruXure Power Generation System. The AC Power Input wire sizes provided in this document are recommendations only. The ATS is provided with a panel board to supply power to multiple loads. Since loading could increase after the product's initial installation, the AC Power Input wires were selected for the maximum current that can be delivered by the panel board. If the ATS is purchased to supply a calculated load rated less than the panel board, and the load will never increase, smaller wires can be used if the requirements in the NEC, CEC, and local codes are followed.

†† Wire sizes to loads shall be in accordance with the ratings of the circuit breakers selected to power the loads.

Environmental

Operating Temperature Range	23 to 104°F / –5 to 40°C; The average temperature over a 24-hour period should not exceed 95°F/35°C.
Operating Relative Humidity	5 to 95%, non condensing
Operating Elevation	0 to 6,562ft /0 to 2000m
Storage Temperature Range	–13 to 131°F / –25 to 55°C; The average temperature over a 24-hour period should not exceed 158°F/70°C
Storage Relative Humidity	5 to 95%, non condensing
Storage Elevation	0 to 49,200ft / 0 to 15000m

Compliance

Safety	UL & cUL Listed to UL 67 (UL1008 for ATS)
Emissions	FCC Verified Class A, Per standard FCC 47 CFR Part 15
Electrostatic Discharge (ESD)	IEC 61000-4-2
Electrical Fast Transients (EFT)	IEC 61000-4-4
Surge Transient	IEC 61000-4-5
Continuous Electromagnetic Susceptibility	IEC 61000-4-3

Warranty, Life-Support Policy, and Service

Warranty

APC warrants that all components of the InfraStruXure system will be free from defect in material and workmanship for a period of two years from the date of start up when start up has been performed by APC authorized service personnel*. If assembly services are included in the original purchase and are also performed by APC authorized service personnel, APC offers an additional year of parts warranty and the first year of on site coverage at no additional charge. In the event that the system fails to meet the forgoing warranty, APC shall repair or replace, at its sole discretion, any such defective parts. Under this warranty, APC will ship all parts to your site at no cost to be available for you the next business day after APC is notified of this requirement. If you choose to upgrade the system to include an on site contract, APC offers modular service packages to match your needs.

Each point product incorporated into the system has a separate factory warranty that is applied when sold as a standalone unit. When incorporated into an InfraStruXure solution, the unit will be covered by the InfraStruXure warranty. In cases where one warranty favors the customer over the other, the stronger of the two warranties will take precedence. The InfraStruXure factory warranty covers only those parts appearing on the bill of materials for that solution. Megawatt UPS systems are not covered under the InfraStruXure factory warranty.

Battery functionality is typically impacted by age and environmental conditions, and therefore certain requirements must be met by the end-user. Failure to adhere to these requirements may put the battery warranty at risk. APC-supplied batteries must always be kept (whether stored or installed) in a climate-controlled environment, and should be re-charged at a minimum of every three (3) months. The battery environment must be free of excessive moisture, construction dirt, corrosive elements, or other contaminants. The temperature range must be maintained at 41 to 95° F (5 to 35° C).

*All warranties are null and void unless startup is performed by authorized an APC Global Services service center.

APC SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY PURCHASER'S OR ANY THIRD PERSON'S MISUSE, NEGLIGENCE, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO REPAIR OR MODIFY, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING OR OTHER HAZARD.

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Life-Support Policy

American Power Conversion Corporation (APC) and its affiliates and subsidiaries worldwide do not recommend the use of any of their products in life-support applications where failure or malfunction of the APC product can be reasonably expected to cause failure of the life-support device or to significantly affect its safety or effectiveness. APC does not permit the use of any of its products in direct patient care. APC will not knowingly sell its products for use in such applications unless the life-support system or direct patient care device is part of a whole facility/building into which the UPS is integrated, and unless APC receives, in writing, assurances satisfactory to APC that:

a. The UPS system will be configured in a manner that will provide N+1 power redundancy to the critical load,

b. The end-user customer assumes all risks and signs the *APC System Configuration and Use Form*, and

c. The customer and operators of the APC UPS system agree to indemnify and hold APC and its affiliates and subsidiaries harmless for any and all claims arising out of the systems use in such applications.

The term *life-support device* includes but is not limited to neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief, or other purposes), autotransfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators (for adults and infants), anesthesia ventilators, infusion pumps, and any other devices designated as “critical” by the U.S. FDA.

Hospital-grade wiring devices and leakage current protection may be ordered as options on many APC UPS systems. APC does not claim that units with these modifications are certified or listed as hospital-grade by APC or any other organization. Therefore these units do not meet the requirements for use in direct patient care.

Service

How to contact APC

Customer support for this or any other APC product is available at no charge in any of the following ways:

- Visit the APC Web site to access documents in the APC Knowledge Base and to submit customer support requests.
  - **www.apc.com** (Corporate Headquarters)
    Connect to localized APC Web sites for specific countries, each of which provides customer support information.
  - **www.apc.com/support/**
    Global support searching APC Knowledge Base and using e-support.
- Contact an APC Customer Support center by telephone or e-mail.
  - Regional centers:

Direct InfraStruXure Customer Support Line	(1)(877)537-0607 (toll free)
APC headquarters U.S., Canada	(1)(800)800-4272 (toll free)
Latin America	(1)(401)789-5735 (USA)
Europe, Middle East, Africa	(353)(91)702000 (Ireland)
Japan	(0) 35434-2021
Australia, New Zealand, South Pacific area	(61) (2) 9955 9366 (Australia)

  - Local, country-specific centers: go to **www.apc.com/support/contact** for contact information.

Contact the APC representative or other distributor from whom you purchased your APC product for information on how to obtain local customer support.

Appendix A: Custom Installations

If Source 2 is a Second Utility Mains Connection

Differences in your system from information presented in this manual

This manual assumes that Source 2 is an APC InfraStruXure Generator. If you have a secondary utility mains connected to the ATS, some of the information in this manual will not apply to your system.

Obviously, your system does not have a generator, and any reference to “generator” in this manual actually refers to your second utility mains connection. Disregard the following sections, as they do not apply to your system:

- “Generator start sequence” on page 7
- “Generator cool-down” on page 7
- “Fuel monitoring/runtime calculation” on page 9
- “Communication converter,” (item 4) page 13
- “Resetting automatic operation on the generator” on page 20
- “Generator” pages 37–38
- “Fuel Alarm Limits” on page 44

If Source 2 is a Generator that is Not an APC InfraStruXure Generator

Differences in your system from information presented in this manual

This manual assumes that Source 2 is an APC InfraStruXure Generator. If you have a generator other than an APC InfraStruXure generator, some of the information in this manual will not apply to your system.

The ATS is designed to work with the APC InfraStruXure Generator, and the ATS does not communicate with other generators. In addition, other generators will operate differently than the generators that are described in this manual. Disregard the following sections, as they do not apply to your system:

- “Generator start sequence” on page 7
- “Generator cool-down” on page 7
- “Fuel monitoring/runtime calculation” on page 9
- “Communication converter,” (item 4) page 13
- “Resetting automatic operation on the generator” on page 20
- “Generator” pages 37–38
- “Fuel Alarm Limits” on page 44

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Radio Frequency Interference

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

USA—FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this user manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. The user will bear sole responsibility for correcting such interference.

Canada—ICES

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

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  - **www.apc.com** (Corporate Headquarters)

    Connect to localized APC Web sites for specific countries, each of which provides customer support information.
  - **www.apc.com/support/**

    Global support searching APC Knowledge Base and using e-support.
- Contact an APC Customer Support center by telephone or e-mail.
  - Regional centers:

Direct InfraStruXure Customer Support Line	(1)(877)537-0607 (toll free)
APC headquarters U.S., Canada	(1)(800)800-4272 (toll free)
Latin America	(1)(401)789-5735 (USA)
Europe, Middle East, Africa	(353)(91)702000 (Ireland)
Japan	(0) 35434-2021
Australia, New Zealand, South Pacific area	(61) (2) 9955 9366 (Australia)

  - Local, country-specific centers: go to **www.apc.com/support/contact** for contact information.

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